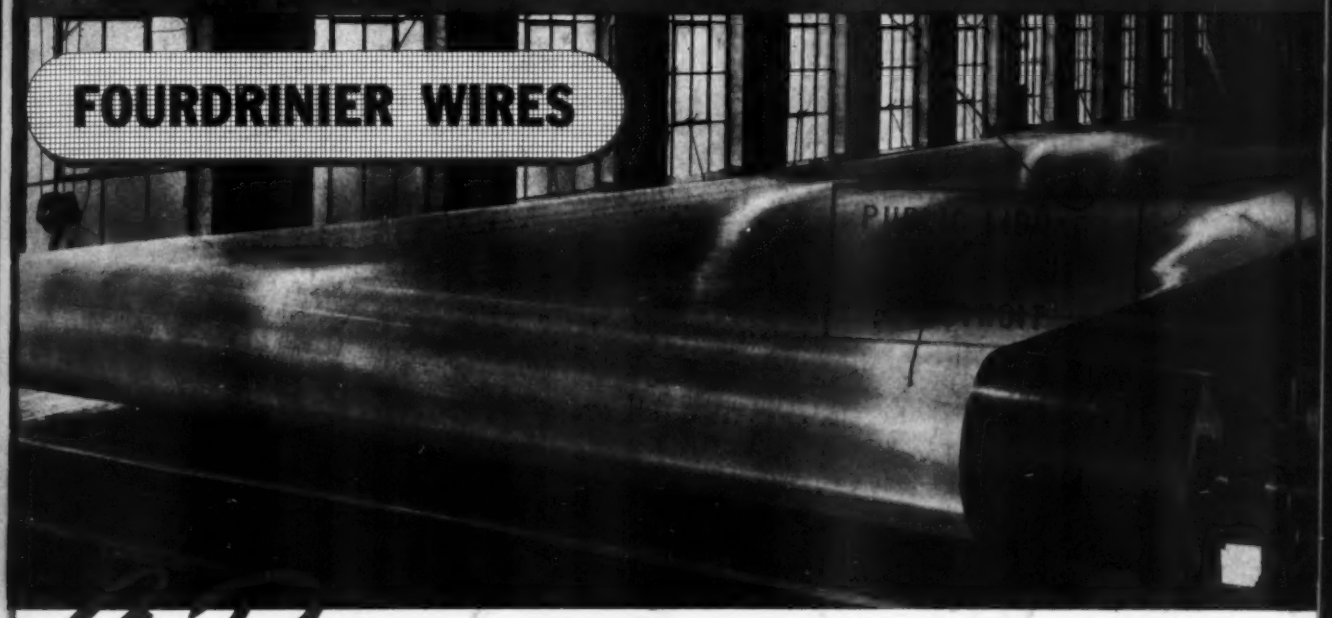
THE PAPER INDUSTRY
and PAPER WORLD
OCTOBER
1949




# A Reminder... and a Promise

Machine men will recall many a Cheney Bigelow Fourdrinier Wire that made a record run. And why not? These hardy veterans came from a husky line — born in 1842 in the earliest days of paper production in America.

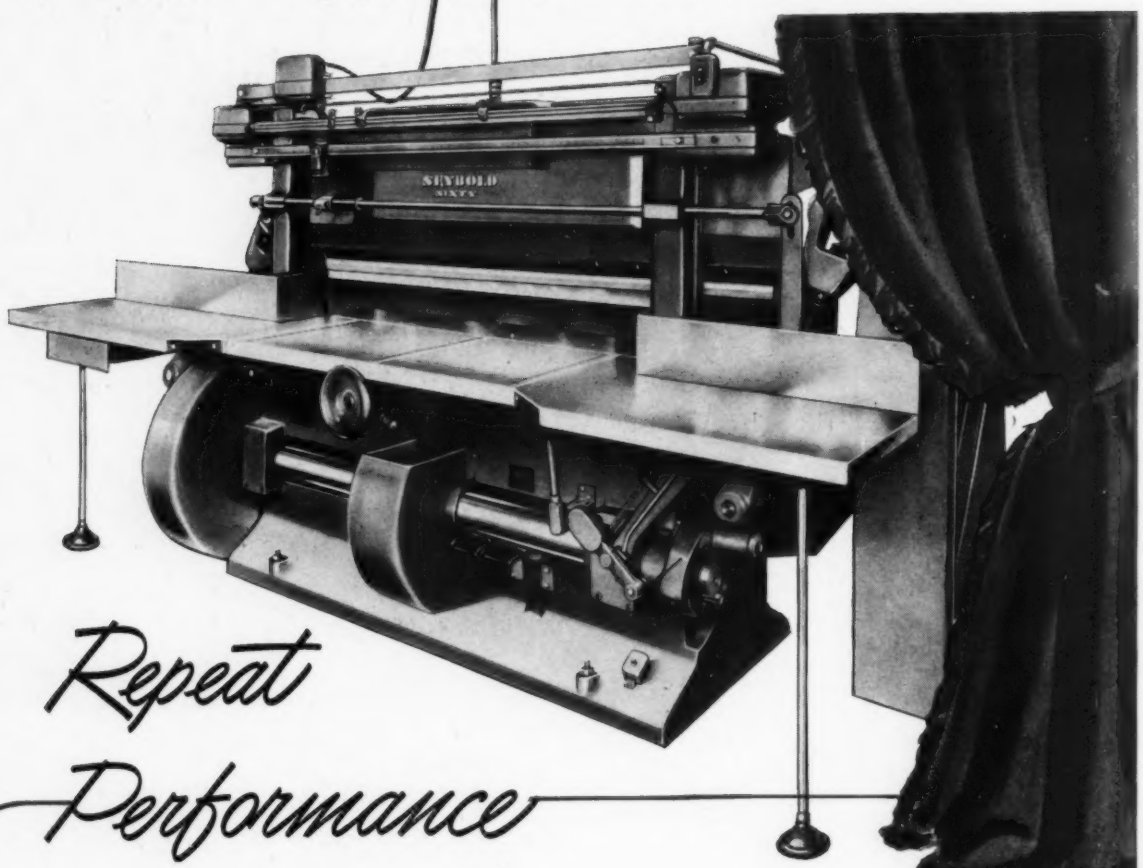
A lot of experience can be gained in 107 years, but experience alone is not enough. Here at Cheney Bigelow, experience is combined with continuous improvement in which new methods, new machines, better and stronger materials are employed to produce wires of improved quality — *wires which are made to meet the conditions on your machines.*

Let us talk to you about your Fourdrinier Wire requirements. Cheney Bigelow Wire Works, Springfield 7, Massachusetts.

PULP & PAPER
CB
MILL EQUIPMENT

Cheney Bigelow
SPRINGFIELD, MASSACHUSETTS

JR v. 31[2] Oct. 1949 - March 1950




# *Repeat Performance*

## WITHOUT VARIATION

Veteran actors admit there are never two performances exactly alike. That's because of the human element.

Cutter operators are human. They repeat the same settings, time after time, but never *exactly* the same. If it's close, it's considered good enough . . . but how many retrims, how many errors, how many rejects are cutting into your profits because of that human element?

Seybold has engineered the human element out of the new SPACER-TRIMMER. *ONE* setting for the series of cuts, at the beginning of the job—and from then on, every setting is automatic; every cut is *exactly* the same.

Trimming is nothing but a *repeat performance* in your finishing room. It's good business to engineer the human element out, to reduce error and increase production with the new SEYBOLD SPACER-TRIMMER!

*All Seybold Mill Trimmers cut with

ZZ-ACTION*

the exclusive Seybold method of putting the knife through the pile.

**HARRIS-SEYBOLD**

**4510 EAST 71st STREET • CLEVELAND 5, OHIO**

Tech.

# North Carolina: kraft container and specialties

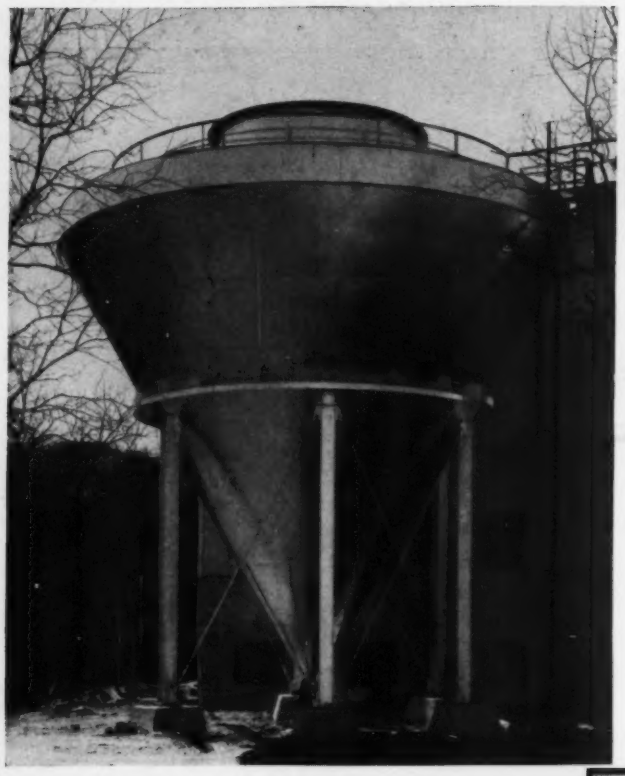
A long stride forward was taken by Kieckhefer Container Company's subsidiary, North Carolina Pulp Co., Plymouth, N. C., when in 1947 its huge expansion program climaxed in the start-up of "The Kraftsman"—216" Beloit giant shown above. High speed and top quality production result from the combination of latest design improvements and paper-making skill. This year, a second phase of expansion was rounded out when the No. 2 machine was completely modernized by Beloit . . . builders of papermaking machinery since 1858.—*Beloit Iron Works, Beloit, Wisconsin.*

BELOIT IRON WORKS PAPER MACHINERY BELOIT, WIS. U.S.A.

*WHEN YOU BUY BELOIT...YOU BUY MORE THAN A MACHINE!*

**BELOIT**

**PAPER MACHINERY**



# The MARX *SAVEALL*

## For High Recovery of Solids From Waste White Water

THE Marx Saveall can help you reduce plant operating costs by recovering suspended fiber from waste white water. Waste is avoided because the fiber and water are physically separated and each is available for re-use.

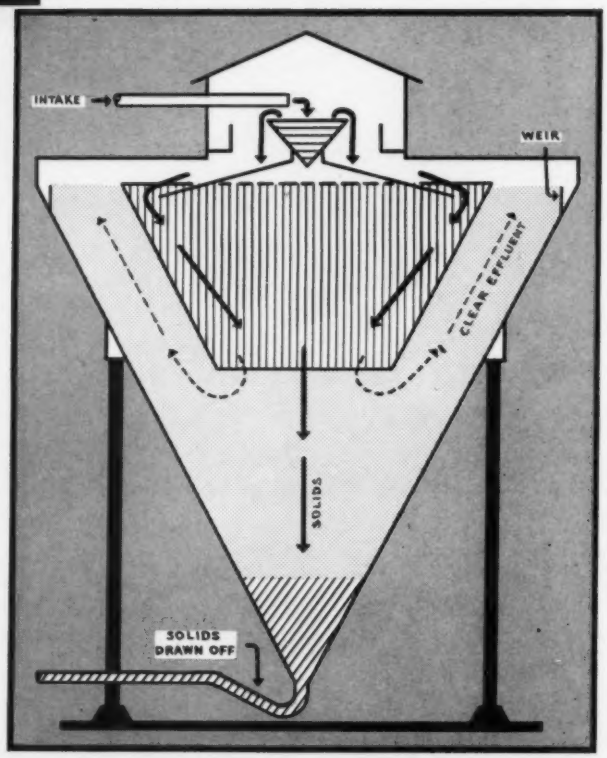
With a Marx Saveall, you can obtain high percentage of recovery by very simple means. A recent report on a paper board mill installation shows that the Saveall is almost 98 percent effective . . . reducing suspended solids in the waste water from 4.66 lbs. to 0.10 lbs. per 1,000 gals. And note from the diagrammatic sketch below that this separation is accomplished solely by gravity settling. No expensive, complicated stirring machinery or filtration equipment is needed.

## How the *SAVEALL* works

The Marx Saveall consists primarily of two large steel plate cones, one mounted inside the other, as shown in the diagram at the right. The inner cone is relatively short and has a large opening at the bottom.

There is a small cone-shaped receiving well at the top of the unit, with an inverted deaeration cone directly underneath it. Waste white water is fed into the receiving well at the top, overflows onto the deaeration plate and runs off its edge into the inner cone. Suspended fibers settle through the inside cone and collect in the bottom of the outside cone. Water, minus most of the solids, rises between the two cones and flows over a circular weir into a draw-off channel.

Marx Savealls are typical examples of the special steel plate structures we build for the paper plants and pulp mills. Let our engineers work with you on your next steel plate requirements.

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# WAX COATINGS IMPROVED with New Du Pont Alathon

TRADE-MARK

**They lose tack, get harder, resist smearing!**

**They become more grease resistant!**

**And they do a better selling job!**

**NOW**—with new Du Pont "Alathon" Polythene Resins, you can greatly improve your wax paper coatings or develop new and different ones. Blends of "Alathon" with paraffin or microcrystalline waxes produce coatings with greater flex life and lacquer-brilliant finishes.

### Offers New Markets

Du Pont "Alathon" opens up new possible uses for wax coatings. For instance, "Alathon" in soft microcrystalline waxes largely eliminates tack and gives a tough, flex-resistant, glossy coating material. Which means you can use these soft, amorphous waxes where you never could before. Paper coated with blends of "Alathon" and wax has much greater sales appeal—longer shelf life, freedom from blocking and better all-around protective qualities.

### Still Another Use

In addition to using them as wax modifiers, you can also coat paper with *pure* "Alathon" Polythene Resins. They are water, chemical and solvent resistant, low in M.V.T., tasteless, odorless and non-toxic. Paper coated with "Alathon" stands up where paper alone fails.

See what Du Pont "Alathon" can do for you. Write today for booklet on "Alathon" Polythene Resins—it's filled with facts and suggested applications for this new paper coating material. Du Pont will be glad to work with you on applications in your plant.

Some suggested uses for coatings of "Alathon" and wax blends—how many more can you think of?
HOT DRINK CUPS
FROZEN FOOD PACKAGES
BUTTER AND LARD CARTONS
SOAP WRAPPERS

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*(Consolidation of the Ammonia and Plastics Departments)*

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**Wilmington 98, Delaware**

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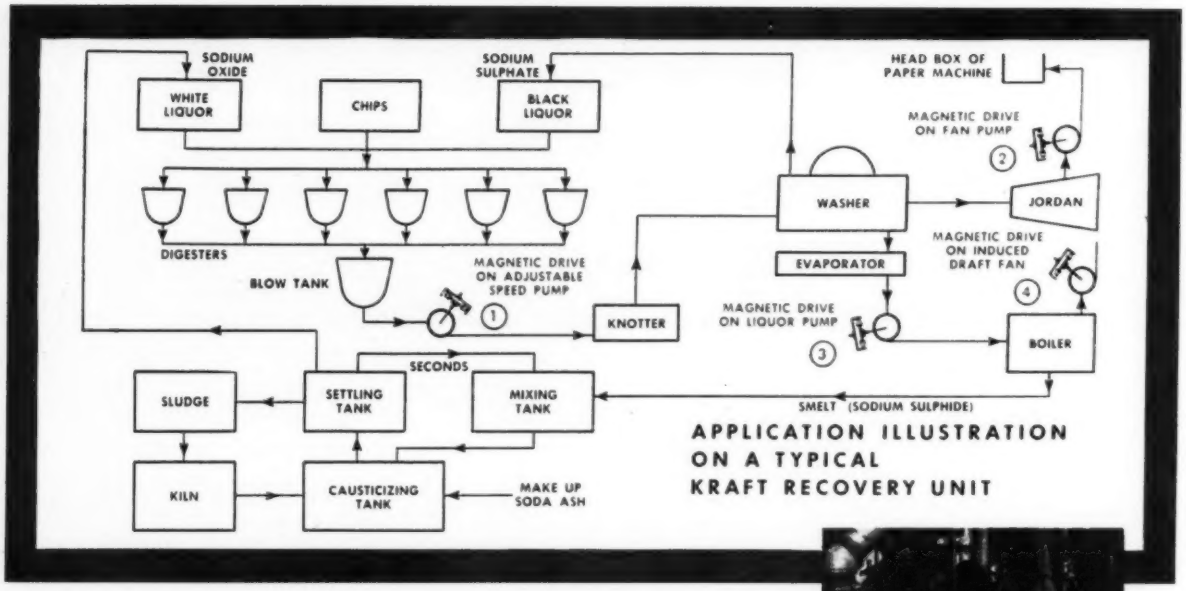
BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

# *Adjustable* speed control

## *comes to centrifugal Pumps and Fans*

# with *constant* speed drive




Here is a simple electro-magnetic torque transmitter offering precise speed control for centrifugal pumps and fans—the E-M Adjustable Speed Magnetic Drive. Installed between a synchronous or induction motor and the driven pump or fan, and operating in combination with an electronic controller, it has provided a money-saving solution to many production problems, as indicated by these examples in paper mills:

**CASE 1**—Stock delivery from blow tank is automatically controlled by E-M Magnetic Drive regulation of pump speed, eliminating clogging at throttling valves and excessive stock delivery due to steam pressure surges during blow down of the digester.

**CASE 2**—E-M Magnetic Drive System controls variations in flow to head box by varying the speed of fan pump.

**CASE 3**—E-M Magnetic Drive System automatically regulates speed of liquor pump to suit varying viscosity of liquor.

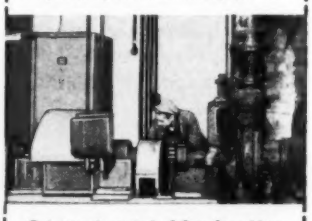
**CASE 4**—Speed of induced draft fan is adjusted to suit draft requirements by E-M Magnetic Drive System.

Your E-M field engineer is ready to show you how E-M Magnetic Drive will solve your pump and fan speed control problems. Also we will be glad to send you our Publication No. 183 telling the whole story of Magnetic Drive construction, operation and advantages. Write for it now.

**ELECTRIC MACHINERY MFG. COMPANY**
**MINNEAPOLIS 13, MINNESOTA**

4400-TPA-2060

● Two 40 h. p., 1707/1056 E-M Magnetic Drives drive black liquor pumps at adjustable speeds in Wisconsin paper mill.



● Automatic control of flow from blow tank is provided by this installation of E-M Magnetic Drive.

● Wide-range, precise boiler draft control provided by this 100 h. p., 870/87 E-M Magnetic Drive Unit.

**ADJUSTABLE-SPEED**
**MAGNETIC DRIVES**

# THE PAPER INDUSTRY and PAPER WORLD

(Reg. U. S. Pat. Off.)

*An Educational News Magazine*

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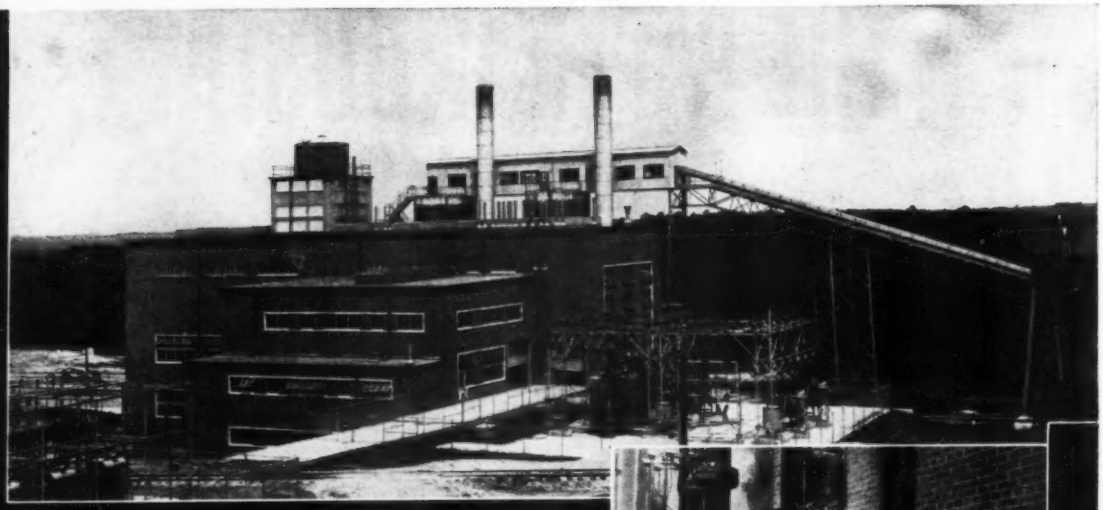
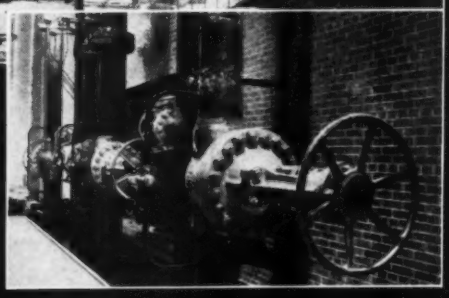
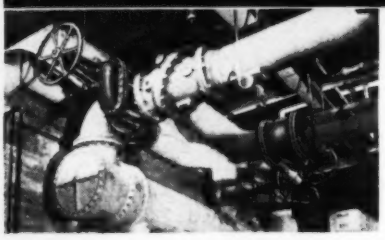




# More power to Springs Bleachery through LUNKENHEIMER VALVES



ARCHITECTS AND ENGINEERS:
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**CALL YOUR DISTRIBUTOR**

**He has the experience and the stock to serve your needs.**

Springs Cotton Mills' Bleachery Division at Grace, S. C., is an outstanding development of one of the nation's largest textile manufacturers.

The power plant is based upon two 150,000 lb. per hour boilers. Large numbers of Lunkenheimer Valves including main steam, boiler feed, check and non-return valves, as well as small and large valves ranging from 125 to 1500 lb. standard for miscellaneous services, are used to control the power and process steam, powerhouse water supply, processing and fire protection.

This modern installation is another interesting example of the high regard in which Lunkenheimer Valves are held throughout all industry. If you are planning new construction or modernization of present facilities, it will pay you to specify Lunkenheimer Valves. Their reputation for lower-cost, trouble-free service is industry-wide.

ESTABLISHED 1862

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"QUALITY"

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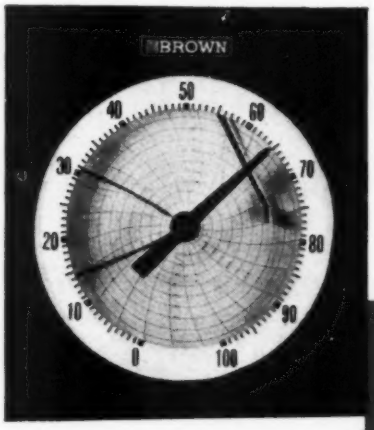
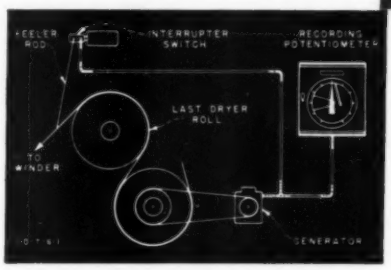



# QUICK and lasting PICTURE of a paper machine's efficiency




The *ElectroniK* Circular Chart Recorder, installed as indicated in diagram above, records the slightest variation in machine speed . . . and the time and number of stoppages, by means of a mercury switch interrupter in the power line.

A PAPER MACHINE's efficiency is measured by its output . . . and such information is important to both operators and management.

The *ElectroniK* Circular Chart Tachometer has a scale which is visible at a distance of 50 feet, important to operators . . . and draws a chart record of speed and stoppages, important to management.

The result is a complete record of the paper machine's performance over an entire 24 hour period . . . a quick, and lasting, picture of the machine's efficiency.

Mills which are using this modern instrument report that the oversized scale and accurate stoppage record contribute noticeably to improved output and quality.

Call in your local Honeywell engineer for more detailed information . . . or write for a copy of Data Sheet #2.9-9.

**MINNEAPOLIS-HONEYWELL REGULATOR CO.**
BROWN INSTRUMENTS DIVISION
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Products offered by Anheuser-Busch to the American paper industry have been produced to meet specific industry requirements. Backed by research and practical "know how", their uniform performance and dependable quality have built an enviable reputation throughout the industry. Write us for further information.

**Corn Products Department**

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# NEWS

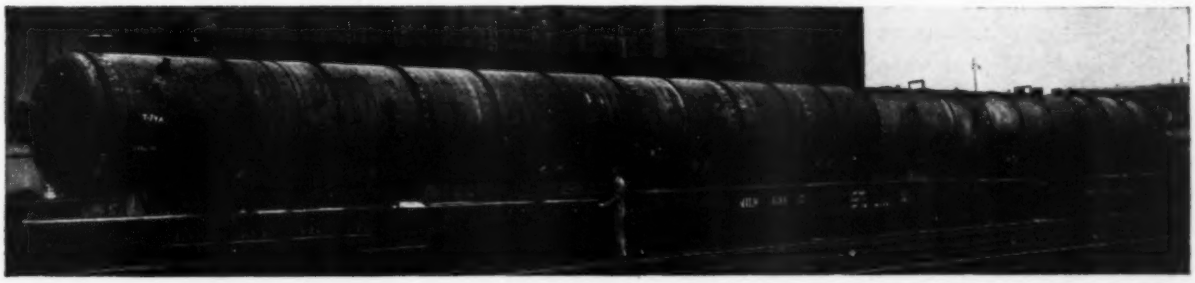
A. O. Smith 75th Anniversary 1876 - 1949

A. O. SMITH Corporation

New York 17 • Philadelphia 3 • Pittsburgh 19 • Atlanta 3 • Chicago 4
Tulsa 3 • Dallas 1 • Houston 2 • Seattle 1 • Las Angeles 14
International Division: Milwaukee 1

**NEW BULLETINS:** Write the nearest A. O. Smith office listed above for these new Bulletins: V-44—Field Assembly of Pressure Vessels; V-46—SMITHway Vessels, Alloy, Alloy-Lined, Clad, and Glass-Lined.

**BY WATER AND RAIL,** A. O. Smith ships pressure vessels for the petroleum, paper, and process industries. The SMITH-lined Fractionating Tower above, one of the largest shop-fabricated vessels ever built (16 ft. diameter by 116 ft. long, weighing over 320,000 lbs.), is going by barge to an oil refinery in the Chicago area.



**SOME 60 SMITHway PRESSURE VESSELS** for both low and high temperature service have been ordered during the last four years by one company to equip two new plants. This SMITHway Tower, three railroad cars long, 116 ft. by 7 ft., weighing 137,000 lbs., is one of the types of vessels furnished.

**THIS MAN KNOWS HIS CURVES:** For 23 years, Frank Hilke has been shaping, to exact diameters, the shell courses of SMITHway Pressure Vessels. He uses a variety of rolls which can produce any diameter needed for pressure vessels.

**RECORDING CONTACT RESISTANCE AS LOW AS 1/1,000,000 OHM.** Intensive research into the surface resistance of various alloys of different finishes and thicknesses has played an important part in the development of the A. O. Smith process of resistance welding alloy linings to carbon steel backing. This SMITH-built instrument was designed to measure the various resistance properties of the alloy linings and is a valuable tool in the control of the quality of A. O. Smith resistance welding.

# RICE BARTON RESEARCH CORPORATION

WORCESTER, MASSACHUSETTS

West Coast Representative
RAY SMYTHE
501 Park Building, Portland 5, Oregon
Telephone: Beacon 0502

## Product and Process Research for the Paper Industry

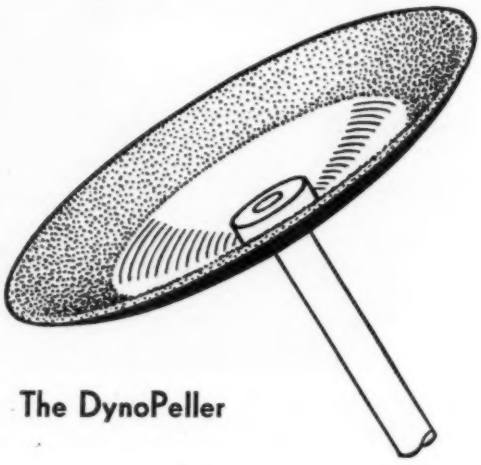
**What is Dynomizing?** It is a better, less expensive and more efficient way of defibering pulp or waste paper.

The heart of all DynoMachines is the DynoPeller. The DynoPeller is a disc which is lined on its concave side with rough, hard carbide particles.

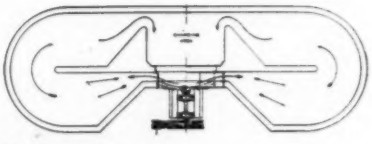
As the DynoPeller rotates, it creates a suction at its center which pulls the stock toward it. Centrifugal force then causes the stock to flow rapidly across the rough carbides.

This effective dynomizing action completely disintegrates the stock. Each fiber is completely separated from its neighbor while maintaining its original length.

There are four types of DynoMachines for either batch or continuous operation. Let us tell you how these machines make better pulp from a given grade of stock and make it at less cost. Write for further information.

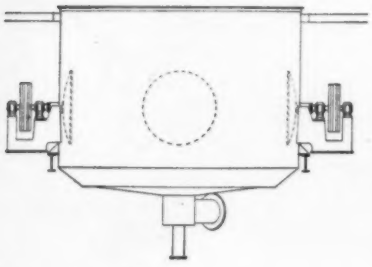


### The DynoPeller



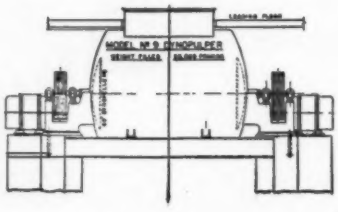
### The DynoChest

. . . has an elongated vat with a midfeather and is equipped with one DynoPeller. It will process broke or slurry. Used for either batch or continuous operation.



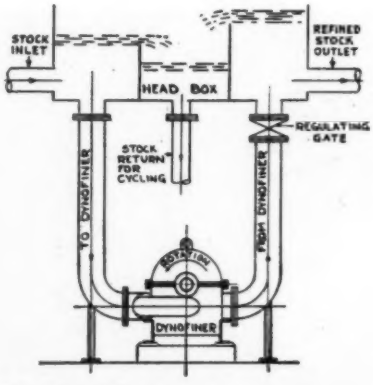
### The QuatroPulper

. . . is composed of a vertical circular vat, open at the top for charging and equipped with four DynoPellers. Primarily designed for large capacities. Stock may be charged all at once. Used for either batch or continuous operation.




### The DynoPulper

. . . is composed of a horizontal circular vat with charging area at its top and equipped with two DynoPellers. Stock charged all at one time. Used for either batch or continuous operation. Available also in laboratory sizes.




### The DynoFiner

. . . is equipped with either four or six small DynoPellers. It is used in a continuous operation and completely separates fiber bundles from slush stock.

# Standard Equipment on Lukenweld Jacketed Steel Drier Rolls . . . .

# Type N JOHNSON Rotary Pressure Joint

**For rotating steam inlet or condensate outlet pipe**

Jacketed Steel Drier Rolls manufactured by Lukenweld, Division of Lukens Steel Company, of Coatesville, Pa., showing the Type N Johnson Joints adopted by the manufacturer as standard equipment.

The Lukenweld Jacketed Steel Drier Roll offers a fine example of why so many machinery manufacturers have standardized on Johnson Rotary Pressure Joints.

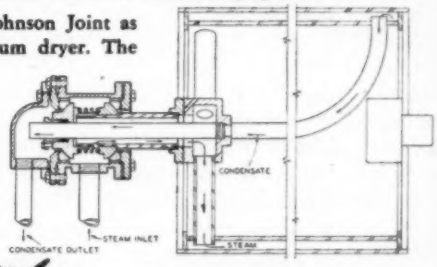
To achieve better condensate drainage in these jacketed rolls, the syphon pipes are made to rotate with the rolls. This would pose quite a problem for ordinary steam fits—to remove condensate through a *rotating* pipe, and at the same time admit steam to roll.

The Type N Johnson Joint is made to order for such a situation. Cross section view shows its construction. It makes the rotating pipe an integral part of the rotating assembly of the Joint—retains in full measure all the packless, self-lubricating, and self-adjusting features of the Johnson Joint.

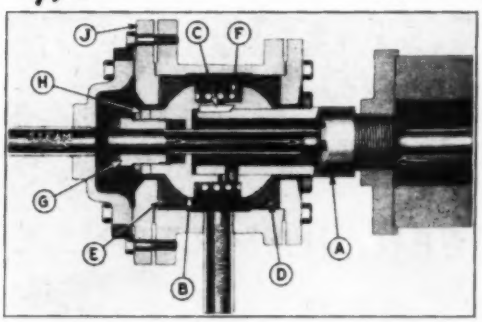
Whatever your operating conditions, there is a type and size of Johnson Joint to make your steam fit troubles a thing of the past.

***Write for new literature; for the Type N ask for special Bulletin JN.***

Drawing of Type N Johnson Joint as installed on double drum dryer. The Type N has been specially developed for use where an auxiliary inlet or outlet pipe rotates with the roll.




## *Here's how the Type N works* . . . .




Nipple (A), which has an integral collar, is connected to roll. Sliding collar (B) is keyed to nipple at (C), but fits loosely so pressure can fill housing and press carbon-graphite seal rings (D) and (E) tightly against collars. Spring (F) is for initial seating only. Note how collar (B) serves as packing box, accepts gland (G), locked in position with nut (H). Purpose of packing is only to seal off condensate from steam, and permit lengthwise movement of rotating pipe. Holding plate (J) facilitates installation.

This picture shows Type N as used with rotating steam distribution pipe; steam enters at left, condensate is removed through body outlet. For rotating syphon pipe, as in Lukenweld application, connections are simply reversed.

**JC** *Product of The* **John Crane Corporation**

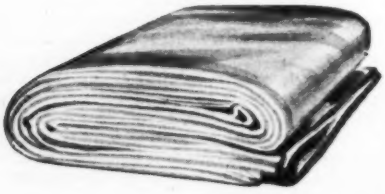
**845 Wood Street, Three Rivers, Michigan**

Rotary Pressure Joints • Compressed Air Separators and Aftercoolers
Direct Operated Solenoid Valves • "Instant" Steam Water Heaters

# Those days are gone forever!

**SUPT.:**
"What's he kicking about? That shipment was just the same as what we sent him when he couldn't get tonnage from anybody else. He didn't complain of the finish so long as he got the tonnage."

**SALES MGR.:**
"Those days are gone forever. Buyers are no longer worried about sources of supply. They are looking for better finish. If we don't have it they have a right to kick—and to refuse to accept delivery."



**For every press** of every paper and board machine there is a Hamilton Felt that will remove more water at higher speed and give your sheets better finish at lower cost.

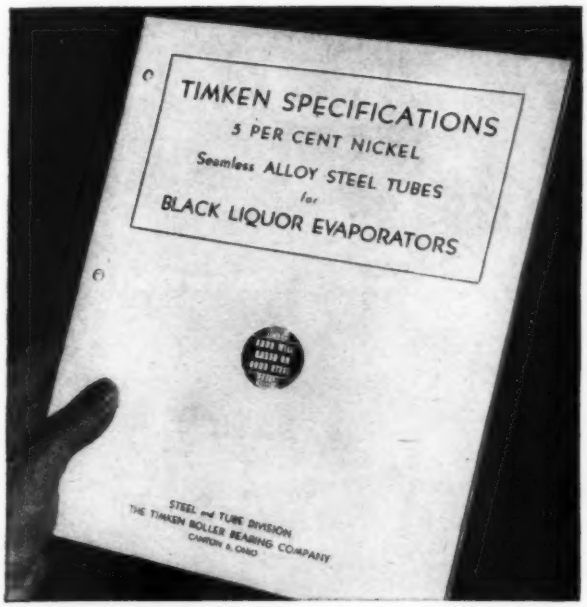
## SHULER & BENNINGHOFEN, HAMILTON, OHIO

Miami Woolen Mills

# Hamilton Felts

Established 1858

# How to be sure 2 ways when you buy black liquor evaporator tubes



**1. NO CRACKS OR FLAWS.** Tube sections must withstand expansion to 20% increased I.D. without showing flaws or cracking.

**2. PRESSURE TESTED.** Each tube must withstand hydrostatic pressure test of 1,000 pounds per square inch before shipment.

**3. CONTROLLED HARDNESS.** Rockwell hardness test on a specimen must show a hardness number not exceeding B 89.

**4. CHEMICAL COMPOSITION.** C-.15 Max., Mn-.50 Max., P-.040 Max., S-.040 Max., Si-10 Min., Ni-4.74-5.25.

## 1. TIMKEN® shows you what you get...

YOU take no chances on quality and performance when you buy Timken® 5% nickel tubes for your black liquor evaporators. You know exactly what you are getting—and you're sure you'll get it!

Timken gives you specifications that cover every essential point—chemical composition, physical properties, tolerances, inspection methods and many others. By providing for definite tests and inspections like those shown above, the Timken Company guarantees that you get exactly what you pay for—in every shipment.

Rigid quality control through every step in manufacture is your assurance that all Timken tubes will always give the same high standards of performance.

## 2. ...and guarantees you'll get it

Through using Timken 5% nickel tubes made to these specifications, leading pulp mill operators for years have been able to cut down the cost of black liquor corrosion by reducing down-time, lowering tube replacement costs, and minimizing tube sheet wear.

We'll be glad to send you a copy of Timken specifications for 5% nickel tubes, without charge or obligation. Write The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

*50th birthday of the company whose products you know by the trade-mark:* TIMKEN

*Specialists in alloy steel—including hot rolled and cold finished alloy steel bars—a complete range of stainless, graphitic and standard tool analyses—and alloy and stainless seamless steel tubing*

# 1 plan helps prevent all 3

When you show the people in your company that you're interested in their welfare, they naturally react favorably. That's why *production goes up* when you boost your employee-participation in the Payroll Savings Plan. Here's how it happens:

The more U. S. Savings Bonds an employee holds, the more secure he feels. The more secure he feels, the greater his peace of mind—the more contented, careful, and productive he is on the job.

Those facts aren't just something we dreamed up. They're borne out in the experience of more than 20,000 companies promoting the Plan.

### Everybody Benefits!

Bond sales spread the national debt, thus increasing our national economic security. And, of course, what's good for the nation is good for you and your business!

The individual Bond buyer gets back $4, when his Bonds mature, for every $3 he invested. That's a boon for him, and —multiplied by millions of Bond holders —represents a huge backlog of purchasing power that will help assure national prosperity through the years ahead.

### Five Steps Boost Participation

**1.** See that a top management man sponsors the Plan.

**2.** Secure the help of the employee organizations in promoting it.

**3.** Adequately use posters and leaflets and run stories and editorials in company publications to inform employees of the Payroll Savings Plan's benefits to them.

**4.** Make a person-to person canvass, once a year, to sign up participants.

These first four steps should win you 40-60% participation. Normal employee turnover necessitates one more step:

**5.** Urge each new employee, at the time he is hired, to sign up.

Nation-wide experience indicates that 50% of your employees can be persuaded to join—without high-pressure selling. All the help you need is available from your State Director, U. S. Treasury Department, Savings Bonds Division. He is listed in your telephone directory. Wouldn't it be a good idea to call him right now, while it's on your mind?

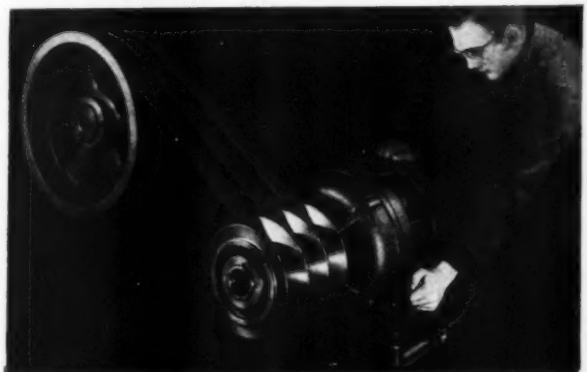
*The Treasury Department acknowledges with appreciation the publication of this message by*

THE PAPER INDUSTRY and PAPER WORLD

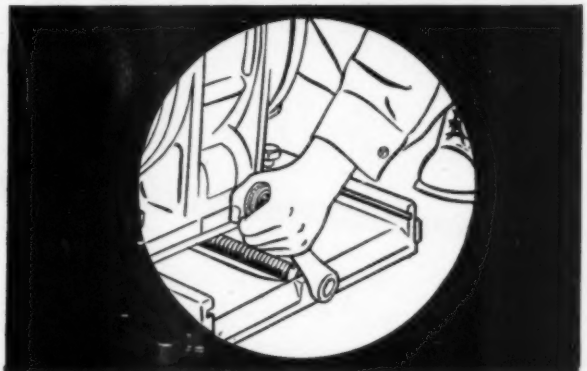
*This is an official U. S. Treasury advertisement prepared under the auspices of the Treasury Department and The Advertising Council.*

Vari-Pitch
AUTOMATIC
SHEAVE

TO GO FASTER—



TO GO SLOWER—



ONE HAND DOES IT—

# TEXROPE *offers Instant, Low Cost Way to*

# Control Machine Speed

- Covers most speed changing applications from 1½ to 40 hp.
- Very simple — one sheave does everything automatically.
- Infinitely variable speed—100% increase; 2 to 1 range.

NOW YOU CAN HAVE all the advantages of instant speed control on all your machines at very low cost and without installing intricate and expensive mechanisms. You can increase production by setting operating speeds at exactly the right tempo for highest production. You can improve quality, change to new materials, all at the twist of a wrist.

All this is made possible by the *new Vari-Pitch* Automatic Sheave which changes pitch diameter and holds proper belt tension *automatically*. Today, ask your A-C Authorized Dealer or Sales Office to give you complete facts and figures on how the new *Vari-Pitch* Automatic Sheave can save money in your operations. Or write for Bulletin 20B7223. A-2837

**ALLIS-CHALMERS, 991A SO. 70 ST.**
**MILWAUKEE, WIS.**

*Texrope* and *Vari-Pitch* are Allis-Chalmers trademarks.

***Sold . . .***
***Applied . . .***
***Serviced . . .***

by Allis-Chalmers Authorized Dealers, Certified Service Shops and Sales Offices throughout the country.

**MOTORS** — ½ to 25,000 hp and up. All types.

**CONTROL** — Manual, magnetic and combination starters; push button stations and components for complete control systems.

**PUMPS** — Integral motor and coupled types. Sizes and ratings to 2500 GPM.

# ALLIS-CHALMERS

# SAVE LABOR
# SAVE DOLLARS

*in the Wrapping of Your Jumbo Rolls*

For Rolls 36" to 40" Diameter
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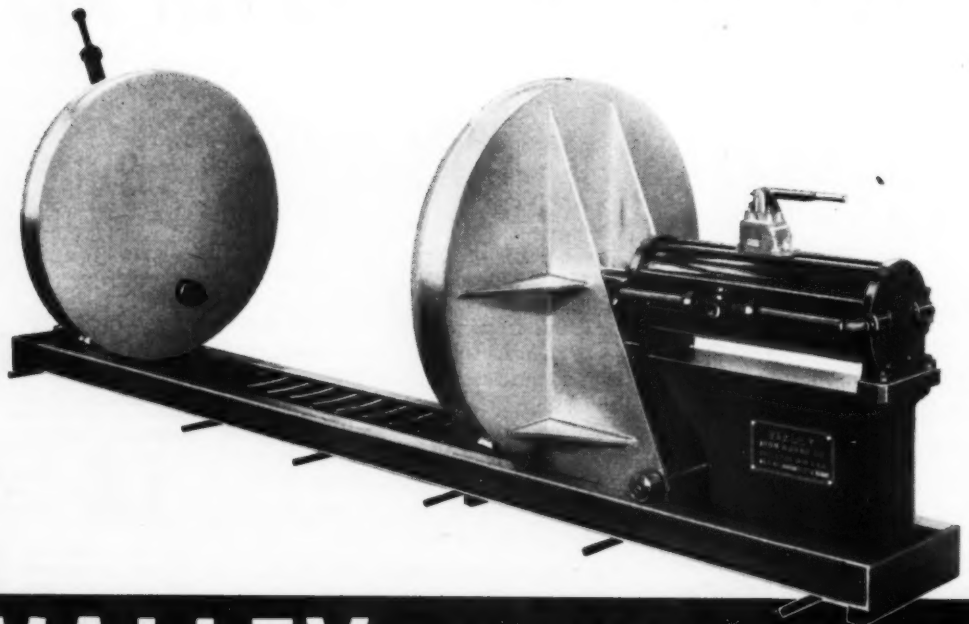
Can also be provided for Scale Mounting, for Greater Convenience in Wrapping and Weighing.

Write for Detailed Information.

# VALLEY
## ROLL END PASTER



# VALLEY IRON WORKS COMPANY
APPLETON, WISCONSIN

Thanks...
60,000 Times
● To you — if you are one of the 60,000 men who operate more than 8,000 Nalco industrial installations — our sincere *thanks.*
Your confidence in the Nalco System of water treatment is the prime factor in a Nalco record of sound, rapid growth that is continuing in step with Nalco research and its resulting developments of even better water treatment chemicals and procedures.
We appreciate your support, and intend to do everything possible to go on deserving it.
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6232 West 66th Place Chicago 38, Illinois
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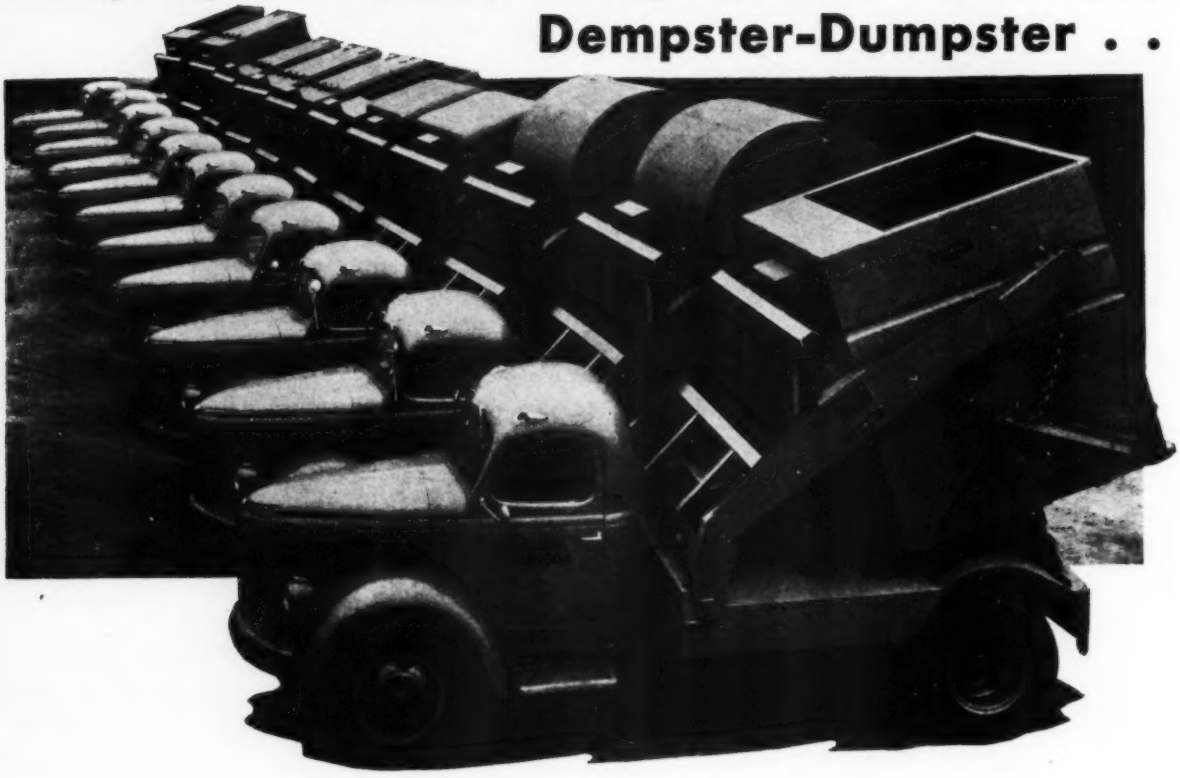
DETROIT PUBLIC LIBRARY

# Keeping the Navy "*Ship Shape*" with the Dempster-Dumpster . .



Shipyards, stations, and the men in Uncle Sam's Navy set a standard of cleanliness that is unsurpassed. Helping to maintain this high standard of Navy cleanliness is the Dempster-Dumpster System of materials handling . . . a system of quick pick-up of preloaded containers for hauling, dumping or moving materials.

Exactly 10 years ago the Navy purchased its first Dempster-Dumpster equipment . . . one truck hoisting unit with several containers. Now there are dozens of hoisting units and thousands of Dempster-Dumpster containers of many types at work keeping Navy yards and stations "ship shape." The sturdy steel foolproof and fireproof containers are placed at various places, such as barracks, mess halls, the docks and ship yards, wherever materials (solids or liquids) need be deposited immediately as they accumulate. A Dempster-Dumpster truck hoisting unit quickly picks-up each container when it is filled and hauls it to the disposal area. Contents are automatically dumped and container returned.

If you have a materials handling problem demanding more cleanliness, more economy, and more efficiency, it will pay you to investigate the Dempster-Dumpster System—popularly used, not only by the armed forces, but by municipalities, leading industrial plants, and by large and small institutions of all kinds.

Photo above shows eleven hoisting units recently delivered to the U. S. Navy. Various types of containers are shown in carrying positions. Photo at left shows a hoisting unit preparing to lift a 10 cu. yd. Flat Top container, while another hoisting unit is dumping a 9 cu. yd. Trash and Rubbish Kolector type container. All controls of unit are conveniently located at the driver's seat. One driver and one truck handles any number of containers regardless of types.

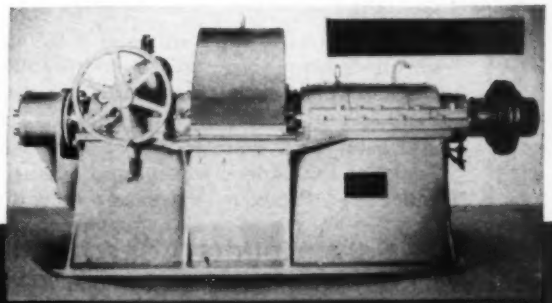
**DEMPSTER BROTHERS INC.**

**7109 Dempster Bldg.**
**Knoxville 17, Tennessee**

# A Little Refiner—A Long Way from Home But Read what it did in only 4 Days

*"To date, we have effected approximately 10% increase in production with improved formation and physical properties. One especially notable result has been that the sizing is greatly improved due to the more uniform degree of refining which we are now getting."*

The foregoing was taken from a letter from a new Sutherland user in South Africa, about 10,000 miles from Trenton, who was obviously delighted with the performance of their small 32" refiner. It's exactly what we've been telling mills for years, i.e., **Increased Production, Better Formation, Higher Strength, Improved Finish,** etc. guaranteed by Sutherlands. Mills now considering stock preparation equipment, which are much closer to our free technical service, should take particular note. **P.S. Many have already learned what this South African mill just found out.**

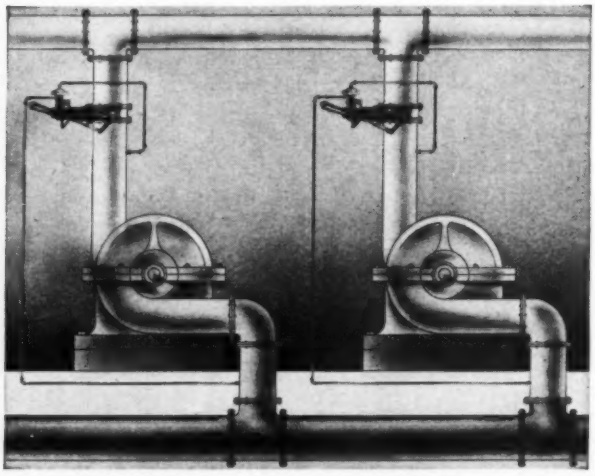


**SUTHERLAND REFINER CORPORATION**
TRENTON, NEW JERSEY

*Manufactured in the United States by Valley Iron Works Co., Appleton, Wisconsin • Sutherland Refiner Ltd., Windsor Hotel, Montreal, P. Q.*

R-S valvEvents

EXCERPTS FROM THE R-S BOOK OF EXPERIENCE



# PROTECT PUMPING UNITS

The hydraulic cylinder controls in the above illustration of synchronous driven pumps are applied to R-S 125-pound Valves. If we assume 55 psi in the common header and a 2-pound lift, the cylinder positioners are set for 56 pounds. The valves will remain open as long as the differential remains above 56 pounds.

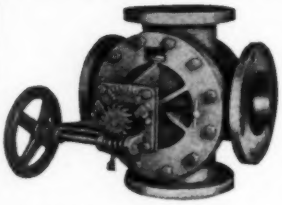
In the event of pump or power failure the natural reaction is for the flow to reverse itself through the pump. However, the drop in differential pressure causes the cylinders to close the valves and prevent reverse flow. Waterhammer is prevented because the valves close only as fast as the bleeding of the cylinder discharge. Similarly, when the motors are started the gradual opening of the valve vanes as pressure differential is regained prevents the pumps from developing an intolerable overload before full power is required.

Such automatic applications of R-S Valves are sensitive, simple and free from trouble. They definitely protect pumping units, prevent water hammer and reverse flow.

Consult with your local R-S representative. Look for the address and phone number listed under "R-S Products, Valves" or write direct.

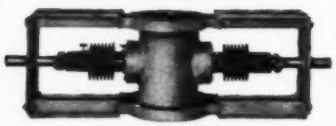
**R-S PRODUCTS CORPORATION**
**Wayne Junction • Philadelphia 44, Pa.**

No. 751 60-inch R-S 50-pound Valve with 5-inch x 20-inch air cylinder positioner. Cylinder utilizes up to 100 psig operating air pressure. Positioner utilizes zero to 15 psig instrument air.



No. 648 8-inch R-S 125-pound 4-way Valve with heavy duty handwheel control and self-locking worm and gear. Widely used in lube-oil plants where sub-zero temperatures tend to freeze the ordinary 4-way valve and hinder its operation.

No. 752 20-inch x 12-inch R-S 150-pound Steel Off-center Relief Valve. The valve is pushed open by the diaphragm top and is closed by counter weights. Note positioner, handjack and exit cone on downstream side.



No. 641 14-inch R-S 600-pound Stainless Steel Valve with double-end shaft and dual finned stuffing boxes for elevated temperatures. Dual mounting brackets for mounting prime movers on either side of valve.

*NO!!!*... we don't mean that the various labor saving devices found in Downingtown machinery will give your mill hands "time to bum," but they will have more time to do other things, because of the many new labor saving features found only in Downingtown Fourdrinier, Cylinder, Wet and Wallboard Forming Machines and other individual units . . . Aside from the major labor saving features in each machine, you'll find many post-war improvements in design and construction. Many of these "thoughtful improvements" may not even show in our specifications or general drawings . . . But your men will see and appreciate them when they operate the machine . . . and, if they don't say it, they'll think to themselves "the man who designed this, or thought of that, had the papermaker in mind." These are the extras you get from Downingtown, that are "not extras in our quotations," but they, plus the major labor saving advantages, all add up to EASE OF OPERATION . . . Call us and, when you order, remember, "you'll get more," in *Thoughtful "Papermill-Wise" Engineering.*

**DOWNINGTOWN MANUFACTURING COMPANY**

**DOWNINGTOWN, PA.**

DESIGNERS AND BUILDERS OF PAPER MAKING MACHINERY SINCE 1880

# The First Paper Money in America

For seventy years after the landing of the Pilgrims, the American Colonists had no money of their own. They bought goods and paid taxes with coins brought from Europe, with tobacco, food, and produce. Then in 1690 Colonial troops returned to Boston from an expedition against the French in Canada. Payment was due them for their services, and to meet the need, the Massachusetts Colony issued the first paper money printed in America. South Carolina issued printed money in 1712, and the other colonies soon followed.

Today, paper money is the common currency of the land. Bills, bonds, notes, checks, credit certificates in every form are printed on paper. Banks, business, and government maintain the nation's economy through pledges on paper—the product most used by man.

*The dramatic story of paper is told in the sound-and-color film, "Paper — Pacemaker of Progress," and in a book under the same title. Both are presented by F. C. Huyck & Sons as a tribute to the Paper Industry. The book will be sent free upon request.*

**F. C. HUYCK & SONS · *Kenwood Mills* · RENSSELAER, N. Y.**

KENWOOD WOOL PRODUCTS

**HUYCK *Felts***

# "I didn't know you people made_____!"

Fill in to suit

We have been in business now for 59 years and yet quite often some good customer of ours says — "Why, I didn't know you people made friction clutches!" Or the exclamation might cover skip hoist drives, car pullers, door hoists or any one of many other Jones products.

In dealing with our suppliers we often find ourselves in the same position. We establish certain buying habits and it sometimes comes as a shock to find that a firm right around the corner may have just the services or the products we need.

We therefore present the group of catalogs shown below with the thought that some one of them may help you solve some problem that has just come up.

**W. A. JONES FOUNDRY & MACHINE CO.**
**4439 Roosevelt Rd., Chicago 24, Ill.**

***Any, or all of these Jones Catalogs sent on request***

No. 70—Jones Herringbone Speed Reducers
No. 71—Jones Cut Gears
No. 75—Jones Worm Helical Speed Reducers
No. 55—Jones Spur Gear Speed Reducer Units
No. 68—Jones Worm Gear Speed Reducers
No. 60—Jones Friction Clutches
No. 8400—Jones V-Belt Sheaves
No. 87—Jones Flexible Couplings
No. 86—Jones Roller Bearing Pillow Blocks
No. 69B—Jones Cast Iron Pulleys

**Jones**

HERRINGBONE — WORM — SPUR — GEAR SPEED REDUCERS
PULLEYS • GEARS • V-BELT SHEAVES • ANTI-FRICTION
PILLOW BLOCKS • FRICTION CLUTCHES • FLEXIBLE COUPLINGS

# Amsco-nagle

## MATERIALS HANDLING

# Pumps

1. Simple design—only three wearing parts.
2. Easy replacement of impeller, casing, and plate without disturbing bearing stand or drive.
3. Water end parts of austenitic manganese steel or ABK Metal, whichever is best suited for the particular job.
4. Stuffing box accessible from above or below.
5. Split bearing stand—easy to dismantle.
6. Initial high efficiency maintained with slippage seal adjustment.
7. Oversized, grease lubricated, deep-grooved ball bearings for long wear with minimum servicing.

*Amsco-nagle 6" Type "T" frame 19 pump for handling surplus sand at the Chillicothe, Ohio plant of Southern Ohio Quarries Company.*

## *Good for BAD mixtures*

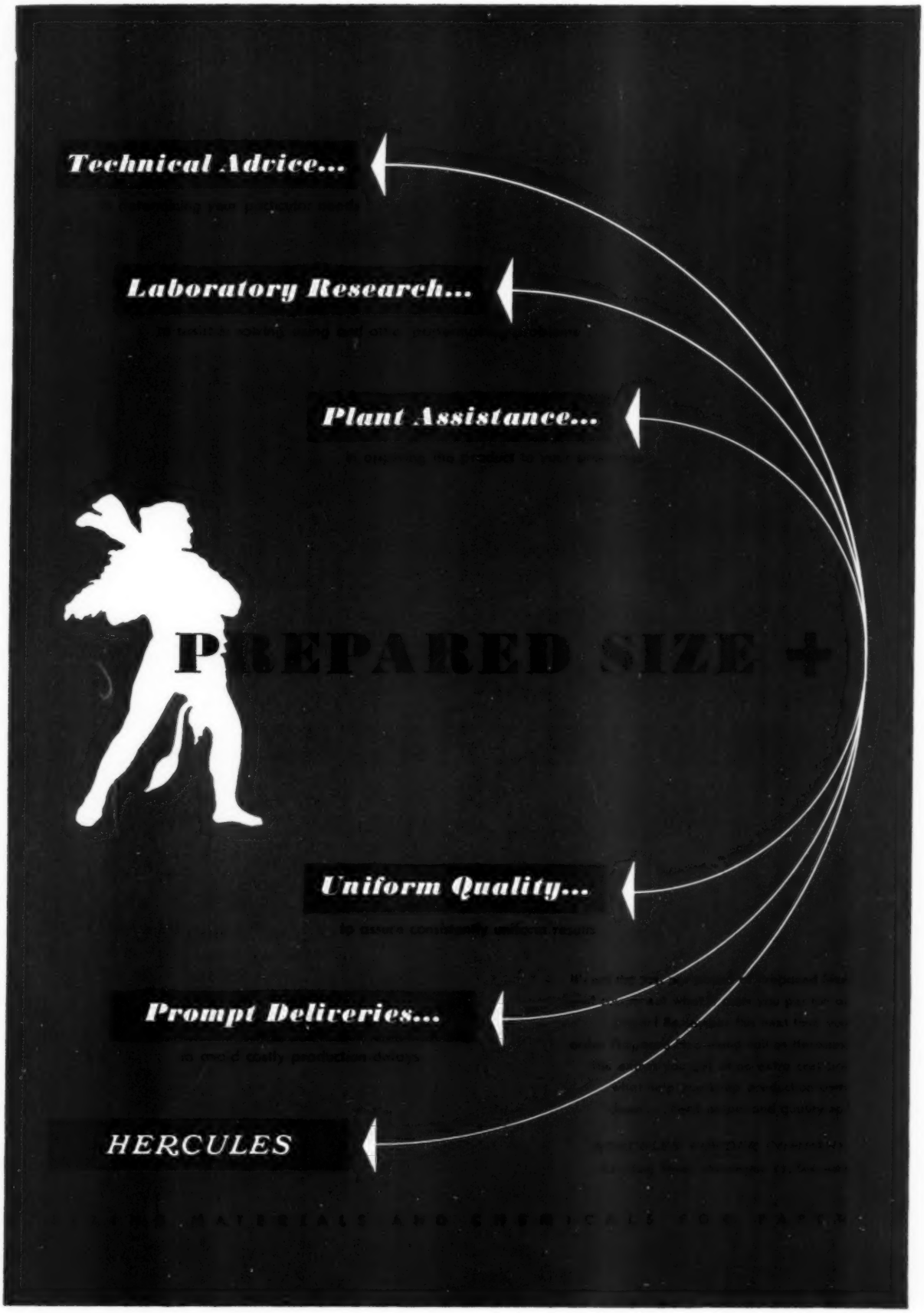
No matter how abrasive the material to be pumped, or how laden with solids, there is an Amsco-nagle Pump for the job. In the pumping of slurries, coal fines, sand and gravel aggregates, sludge and similar materials, an Amsco-nagle will outpump and outwear ordinary equipment by a substantial margin. In many applications Amsco-nagle Pumps are performing with satisfaction where other pumps have failed.

Amsco-nagle pumps are manufactured in sizes 6" to 16", for capacities up to 10,000 G. P. M. and for heads up to 200 feet (250 feet for certain applications). We will be glad to supply you with full information. Write for Bulletin 547-IP for data on all types of Amsco-nagle Industrial Pumps.

AMERICAN Brake Shoe COMPANY

**AMERICAN MANGANESE STEEL DIVISION**
CHICAGO HEIGHTS, ILL.

**Foundries at Chicago Heights, Ill., New Castle, Del., Denver, Colo., Oakland, Calif., Los Angeles, Calif., St. Louis, Mo.**
**Offices in principal cities. In Canada: Joliette Steel Limited, Joliette, Que.**


Technical Advice...
Laboratory Research...
Plant Assistance...
PREPARED SIZE +
Uniform Quality...
Prompt Deliveries...
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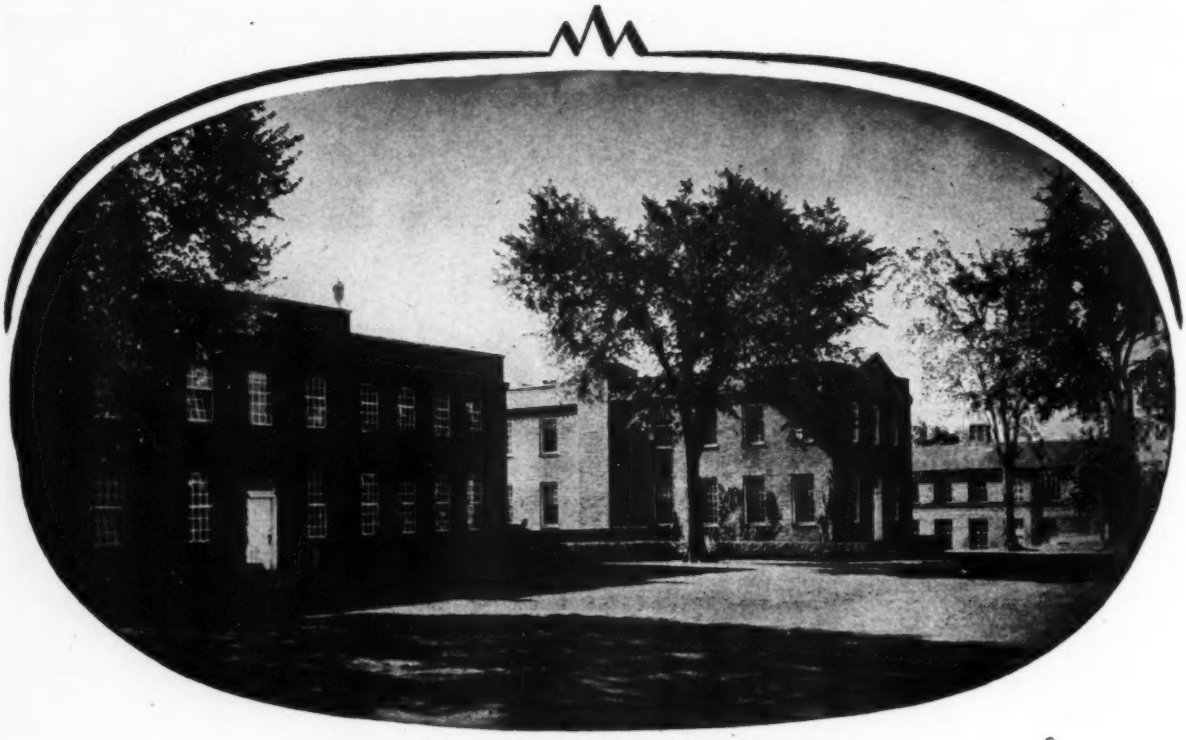


THE VANDERBILT LABORATORY—NORWALK, CONN.

# Use the
# VANDERBILT LABORATORY

★

Now, more than ever before, it is important to keep production at peak efficiency. Visit our laboratory, bring your problems and let our facilities help you solve them. Here, we can show you how our materials can be used to your best advantage. We invite and appreciate your cooperation.

★

## R. T. VANDERBILT CO., INC.

*230 Park Avenue, New York City*

THE PAPER INDUSTRY
and PAPER WORLD
OCTOBER 1949

# Editorial

## Advertising and Public Service

▸▸▸ LEAFING THROUGH the annual report of the Advertising Council, we are reminded of the high caliber of services rendered by that organization. Support of such projects as better schools, forest fire prevention, safety and accident prevention, Community Chest and Red Cross, to name a few, has been consistently increasing due to a growing interest in this work.

Now beginning its eighth year of existence, the Advertising Council is a private nonprofit, nonpartisan organization supported and operated by advertisers, advertising agencies and various publications for the purpose of utilizing advertising in the solution of national problems. It is classified as an educational institution by the Department of Internal Revenue. Last year 123 requests for help were received from private organizations and departments of government. Of this number, 66 were rejected and 57 were given some degree of help.

Before the Council approves aid to a given project, it requires (1) that the project can be successfully implemented through advertising, (2) that it is in the interest of the people as a whole, (3) that it is timely, and (4) that it is noncommercial, nonpartisan, and not designed to influence legislation.

Projects undertaken by the Council have been brought daily to the attention of all of us through the pages of newspapers and magazines, on car cards in street cars, trains and buses, on outdoor billboards, on the radio-television, and through Sunday supplements and business papers. Even comic books have been utilized in the effort to get messages across to as many people as possible. Who cannot recall many an arresting picture they have seen this past year, urging them to buy government bonds, to drive safely, to aid in the recruitment of nurses, or simply to be proud of the American way of life.

With so much emphasis these days on the rotten spots in our political and economic life, it is refreshing to know of at least one group that is co-operating fully in the support of the public welfare. Operating on the principle that "What helps people helps business," the Advertising Council can be justifiably pleased with its accomplishments. This magazine is proud to have had the opportunity to participate in this work.

▼

## Emphasis on Free Enterprise

▸▸▸ THAT THE PEOPLE of this country are becoming increasingly aware of the need to preserve our free enterprise system is evidenced by the amount of time and effort devoted to this subject at most meetings and conventions of any consequence.

The recent TAPPI meeting in Portland was no exception. One of the luncheon speakers, Harold Foley, Powell River Company, Ltd., pointed out that the profit motive is a prerequisite to free enterprise. He stressed the need for taking advantage of all technological improvements in keeping costs down and quality up. To sell for a profit, industry must produce desirable, high quality goods at prices people can afford to pay.

At the same meeting, Alexander R. Heron of Crown Zellerbach Corporation discussed another fact of management—its responsibility to provide jobs for those who wish to work. In this day of specialization and mass production, it is impossible for the average workman to sell his services except to highly integrated industry. When industry fails to provide jobs, the average American workman—who is a specialist of one kind or another—finds it difficult to make a living. According to Mr. Heron, management must accept its responsibility or government will take over.

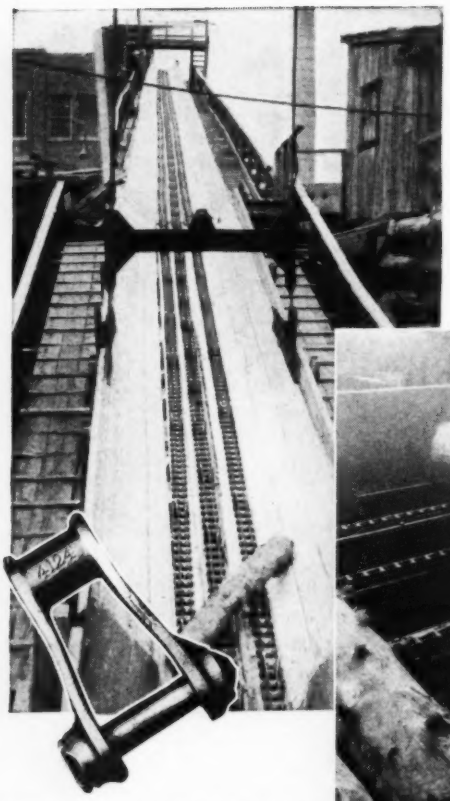
In a similar vein, Herman W. Steinkraus, president of the United States Chamber of Commerce, brought out before the American Mining Congress the need for establishing sound relations between employer and employee. To do this, management must give consideration and understanding to demands which stem from the human desire for security. One of the most important requirements, according to Mr. Steinkraus, is the need to level out the employment curve in individual plants as well as in our whole industrial machine. He added that levelling out the drastic ups and downs in our economy is not only good human practice but is good business practice as well. Most enlightened people in labor, government and management are convinced that human aspirations and business aspirations are completely dependent on each other.

It is obvious to many that freedom of the individual and free enterprise go hand in hand. We had a high degree of government control during the war and found it distasteful, even though it

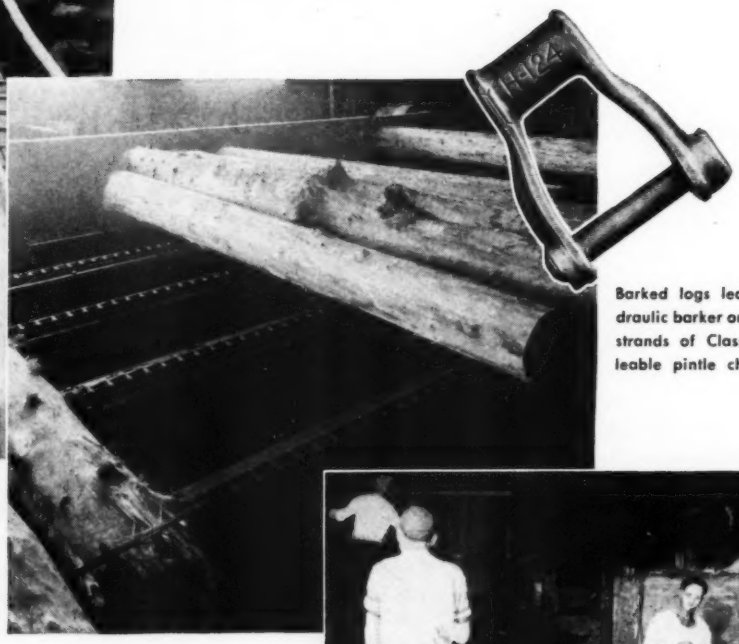
Everybody benefits . . . Everybody gives
COMMUNITY CHEST
MANY CAMPAIGNS IN ONE

# LINK-BELT CHAINS

## *for Superior Service in pulpwood log handling*



From boat to woodroom, logs are carried by #4124 pintle chain of Promal, the stronger, longer-wearing metal.



Barked logs leaving hydraulic barker on multiple strands of Class H malleable pintle chain.

Nine strands of Class C combination chain of malleable iron and steel, form this sorting conveyor taking logs from barking drums to chipper, or to groundwood log storage on upper floor.

Pulp and paper mills interested in efficient operation and low overall costs find that Link-Belt chains and sprockets for drives and conveyors give them these qualities in extra measure. From the various Link-Belt types, with numerous variations as to size and attachments, can be supplied a chain precisely suited to each application. Link-Belt's long experience and unmatched facilities assure you superior performance and long life on any installation.

Consult Link-Belt on conveying, materials handling and power transmission problems.

11.596

**LINK-BELT COMPANY**

Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Dallas 1, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8. Offices, Factory Branch Stores and Distributors in Principal Cities.

**LINK-BELT**

**CHAINS AND SPROCKETS**

*for conveyors • for drives • for power transmission*

was necessary. Experiences in other countries seem to back up our conviction that individual freedom loses ground when government assumes the responsibility of industrial management. This danger was recognized even in the early days of our country by Thomas Jefferson, who said, "Were we directed from Washington when to sow and when to reap, we should soon want bread."

▼

## Paper Products Facing Increasing Consumption

▶▶▶ IN THE TWO MONTHS of August and September, the over-all business of the country reversed its trend of the first seven months of this year. This was overdue, but nonetheless welcomed by all segments of our economy.

Measured by the monthly changes in the Federal Reserve Bank's Index Number of industrial activity, the following record will show the trend:

1949

| | |
|---|---|
| January | 191 |
| February | 189 |
| March | 184 |
| April | 179 |
| May | 174 |
| June | 169 |
| July | 162* |
| August | 170 |

(*) The lowest since February, 1946

That August rebound of 8 points to 170 was a honey. When applied to the paper industry, it reveals a consumption increase of 1,088,000 tons above the July consumption yearly rate.

For the big factor disclosed by this first seven months operation in the paper industry is that all the time inventories were being liquidated and orders were being withheld from the mills, a huge postwar consumption of paper products was being maintained.

Concurrently, the mills were adjusting their operations to their orders in hand, so that by the first of August, with inventories depleted, the current shipments from mills were insufficient to fill the consumptive demand and a sudden aggregate of large tonnage burst upon the producers—a demand in these past two months which will take the balance of the year for the mills to fulfill. This is the situation in the paper industry at the beginning of October.

Naturally, one might ask—what is the significance of the Federal Reserve Bank Index Number to the paper industry?

For the year, 1948, the average of the index numbers by months was 191.4. That indicated a yearly consumption of a trifle over 26,000,000 tons and from the paper industry's report of the consumption for 1948, it actually was 26,000,000 tons plus.

For 1949, the January Index Number was 191, indicating a consumption rate of 25,903,000 tons yearly. For July, 1949, the Index Number was 162, indicating a drop to 22,068,000 tons as the yearly rate. The difference between the January yearly rate and the July yearly rate is 3,835,000 tons.

But, there was no such shrinkage of consumptive demand during that period, for the average of the seven months Index Numbers—from January to July inclusive, was 178.3, indicating a yearly consumption rate of 24,255,000 tons.

Therefore, the July activity, indicating a consumption rate of only 22,068,000 tons was too low because it was 2,187,000 tons under the average consumptive demand of 24,255,000 tons during the entire first seven months.

Hence, it was inevitable that a sharp upturn to bring production up to balance the consumptive demand was overdue in July. In fact, as we wrote in this column in the August number, when the August rebound tonnage record was in, it would prove that the July decline was "wholly unwarranted." It was. It declined 7 points in July and bounded right back 8 points in August.

September will show a further Index Number advance—possibly as high as 174. However, the activity during the last two weeks of September was over-shadowed by the menace of the steel strike.

The steel strike is on at this writing. The duration of the strike will affect the October business activity.

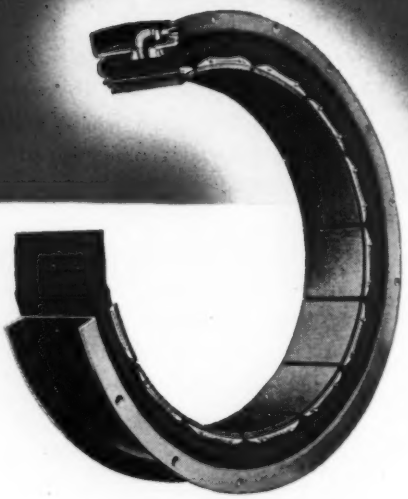
Our opinion is that the strike will be compromised shortly. The pity of it is that there should be a strike. Everyone will lose—the public, the companies, the employees and a host of other innocent victims of the strike. Making public inconvenience and loss, the basic principles for obtaining a more prosperous condition of life, strikes us as being both stupid and unintelligent.

Co-operation between labor and management, arbitration and the determination of our courts of equity will certainly work more efficaciously to the benefit and prosperity of all, even though not so tragically spectacular.

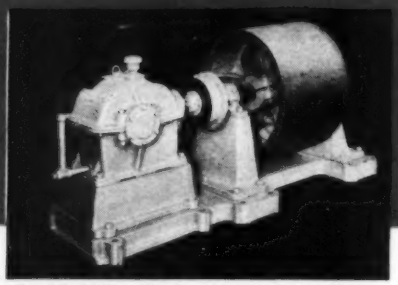
So, while the economic outlook for business has improved and gives promise of further prosperous progress, yet, in these opening days of October, which should have been the banner month for performance of this year, we are finding business tinged with doubt as to the effects of an unnecessary menace. We have plenty of menaces outside the borders of our country, without erecting any within.

# ONLY ONE MOVING PART

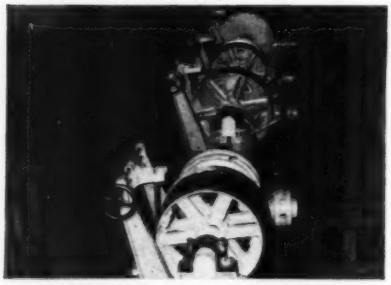
# in this Fawick Clutch



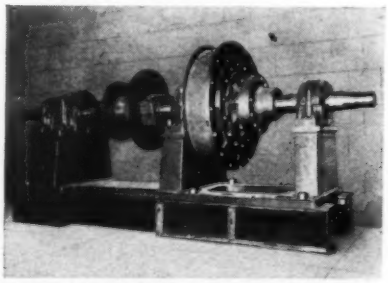
Fawick Airflex Clutch or Brake Type CB



Fawick Airflex Clutch on Pusey Jones Corporation Dryer Drive at Maracalus Mfg. Co., East Paterson, New Jersey.



Fawick Airflex Clutches on 3 Press Drives of No. 2 Paper Machine at Howard Smith Paper Co., Ltd., Cornwall, Ontario.



Fawick Airflex Clutch used on No. 3 Paper Machine Dryer Drive at Hammermill Paper Co., Erie, Pennsylvania.

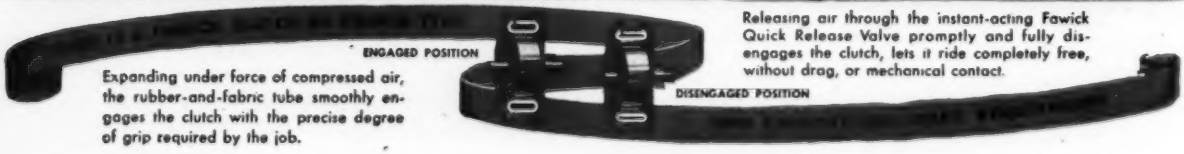
The rubber-and-fabric pneumatic tube faced with friction shoe assemblies is the only moving part in this Fawick Clutch. This part naturally stays in perfect adjustment at all times—automatically compensating for wear of the friction shoes.

Job-tested, Fawick Clutches meet the toughest operating conditions in many fields—petroleum, earth-moving, metalworking, rubber, paper, pulp and others.

Write our engineering department for a recommendation of the Fawick elements best suited for your machines. Address Dept. P1.

FAWICK Airflex CO., INC.

2919 CLINTON ROAD CLEVELAND 13, OHIO




Expanding under force of compressed air, the rubber-and-fabric tube smoothly engages the clutch with the precise degree of grip required by the job.

Releasing air through the instant-acting Fawick Quick Release Valve promptly and fully disengages the clutch, lets it ride completely free, without drag, or mechanical contact.

# Current Comment . . .

**The opinions expressed here are from a commentator close to the industry, who, in the past, has interpreted briefly the trends of the paper industry. His comments, which hereafter will appear at greater length than before, and in broader scope, are based entirely on economic and financial facts that emanate regularly from sources that speak with authority.**

## What Will Result From Devaluation of Foreign Currency?

▸▸▸ AT A TIME WHEN the United States paper industry was rapidly finding its way back to profitable, quantitative operation, after the slump in June, the devaluation of foreign currency came as a major disturbing element. It will be weeks before the effect of this action can be definitely measured, but it might well prove to be a brake on the American industrial machine, applied suddenly, and vigorously, when not anticipated. There had been an expectation that the British pound sterling would be somewhat devalued, but the extent of the devaluation was a surprise. Followed by an equivalent devaluation of 30 per cent in the currencies of practically every other European country, the possibilities of injury to United States paper producers are great.

The extent of the effect on the American economy will depend on two factors:

*First*, the willingness and ability of Europe to take advantage of the devaluation of currency to its maximum extent;

*Second*, the strength of American industry to resist an impulse to meet foreign price cutting by universal reduction of American prices to those of the European competitors.

There is already a trend in European labor circles to demand wage increases to compensate for the higher prices of goods, especially food, which must be imported. Any such wage increases will minimize the devaluation by cutting the margin of advantage provided by this mechanism. There is also the question of the existence of factory capacity to produce paper in a volume sufficient to dent the American market. On the other hand, it would be normal for American mills to cut prices to meet the lowered quotations by foreign producers.

It is certain that losses will be entailed for American investors and paper mill employees. Every ton of imported paper represents the loss of a working day by three highly paid American workmen. Either American mills must cut production costs—meaning principally labor—or lose sales. In the latter event, labor loses working time. If prices are reduced, it can only be at the loss of profits to the investors, or a reduced hourly wage for the workers, or both. It is already apparent that the issue of tariffs will be a major factor in the congressional elections of 1950 and probably the 1952 presidential election.

An analysis of the potential results of the 30 per cent depreciation of European currencies and the 10 per cent devaluation of the Canadian dollar involves three phases of the paper industry.

### Pulp

In the case of pulp, it now appears that the impact will not be felt before the first quarter of 1950. Swedish producers are under contract to deliver considerable pulp elsewhere than to the United States, at prices below those current on this side of the ocean. In any event it takes time to secure orders and effect deliveries, even of stocks on hand. Canadian and American mills already have gone on record as being unwilling to reduce their own fourth-quarter prices, or make concessions on contracts already written.

### Newsprint

Newsprint, which involves shipments of roughly four millions tons a year from Canada apparently would be affected. However, Canadian producers already have gone on record as unwilling to cut prices to an amount equal to the Canadian devaluation of the dollar. That 10 per cent devaluation means a sale by Canada of four million tons a year of a $100 product, which means the equivalent of $110 in Canadian money. Whether the producers reap this profit, or the Government, as it has done before, takes steps to prevent this profit from being transferred to American owners of Canadian paper mill securities. Finnish shipments, while potentially lower priced, cannot be in sufficient volume to break the American market price.

### Paper

In pulp and newsprint, therefore, there will be no immediate adverse impact on the United States economy. In the case of paper, however, there can be widespread severe competition. A 30 per cent devaluation of currency in papermaking nations theoretically nullifies all tariff rates on paper, except for three very minor grades. There are only these three grades, greaseproof, decorated wrapping paper and one minor tissue paper specialty which have tariff protection of more than 30 per cent. All grades face the same possibility as has been estimated for kraft wrapping paper. In this case, the duty rate is 20 per cent and the devaluation in Sweden 30 per cent. In Finland there was a prior devaluation, the total depreciation being now close to 50 per cent. Swedish kraft, sold this summer at a 5 cent basis by Sweden, can now be sold at 3.92 cents. This means that such paper, formerly delivered in this market duty paid at 6.7 cents, can now be sold at 4.7 cents, plus freight. Here as in the case of pulp, it will take time to place orders and effect deliveries, so the lower priced importations will not be in this market immediately.

### Reciprocal Trade

In the face of this situation, domestic industry faces conditions in its Washington Government which are far from encouraging. The President has signed the bill permitting further reciprocal trade negotiations for further rate reductions, and the results of those already concluded at Annecy, France, are still to be made public. These negotiations covered all wrapping papers and paperboards. This Government has also promised England to modify our tariff laws, by amended regulations and by legislation to be introduced at the next session of Congress to modify the procedure previously used, in addition to duty rates, to protect domestic industry from improper valuations and classifications of imported merchandise.

A threat of increased taxes to take our Government out of the red has been formally issued from the Democratic high command.

To turn to the brighter side of the picture: The industry has definitely been on the upgrade for the last month, and production has increased to a far higher percentage of capacity than earlier in the year. The August average was the highest since March, and one week in September was only three points under the high 1948 average. Government contract purchases for the fourth quarter were at higher levels, and there are all indications that overall consumption is running ahead of production. Inventories are not large and the best indication is in the upturn in demand for paperboard, which has been lagging.

If domestic industry does not allow itself to be stampeded by events abroad, there is no reason to believe that the storm cannot be weathered without a serious setback.

### Pending Legislation

National business developments are giving Washington authorities cause for careful study of future legislation. The imminence of strikes in the great coal and steel industries is inclining the more radical members of Congress to lay less stress on their original objectives. There is definitely a slowdown in the demand for additional social security benefits and for free medical service. The Republican demand for less radical tariff reduction activities is growing and any impairment of the employment situation will accentuate this feeling. The Senate, however, has confirmed the appointment of John Carson as a Federal Trade Commissioner, despite Republican claims that he is by nature opposed to private initiative in business. Despite the threats of coal and steel strikes, labor generally is giving signs of realization that its standards of living are threatened by too close an approach to the socialistic type of government which has ruled in England.

Big corporations are giving attention to the provisions of Section 102 of the Revenue Act which would penalize unreasonable accumulations of capital, and there may be a wave of extra dividends to reduce over-large surpluses.

ECA officials have promised to pay heed to the demand from paper and pulp producing states that a larger share of ECA purchases of such material be made in this country, instead of spending the Administration funds in purchases from other countries.

Washington officials expect a drop in exports as a result of the depreciation of foreign currencies, which will increase the cost of our merchandise in those countries. It would cost 30 per cent more to buy American wheat than was the case before devaluation. Foreign nations are thus expected to make all purchases possible from countries which have followed the British devaluation program, and American exports to Latin America are likely to be affected similarly, even though their currencies have not been changed to any great extent.

Reports to Washington from Geneva state that a proposed survey of the European pulp situation has been dropped. In the discussion of this proposal the Swedish representative on the United Nations Economic Commission stated that in his opinion the United States would never again be a regular customer for European wood pulp, and that his country needed additional outlets for its product.

## FINANCIAL

▶▶▶ SECURITIES markets strengthened notably during September, and paper mill issues shared in the advance, which, while not spectacular, was definitely enough on the upturn to indicate confidence in the future.

*Celotex Corporation* — Net income for nine months ended July 31 was $887,921 as against $5,020,657 for the comparable period a year ago.

*United Board & Carton Corporation*—Net income for twelve weeks ended Aug. 20 was $21,997 as compared with $78,322 for the comparable period a year ago. For twelve months ended May 31 the net loss was $322,330 as compared with a profit of $1,222,736 in the previous year.

*Crown Zellerbach Corporation*—Net income for the twelve weeks ended July 31 was $4,039,600 as compared with $3,398,042 for the preceding quarter and for the fiscal year ended April 30 profit was $21,179,080 as compared with $19,614,698 for the preceding fiscal year.

*Hollingsworth & Whitney Company*—Net profit for 26 weeks ended July 3 was $908,470 as compared with $1,858,639 for the first half of 1948.

*Marathon Corporation* — Net profit for nine months ended July 31 was $3,390,857 as compared with $4,290,336 for the like period a year ago.

**New York Stock Exchange—Stocks**

| | Closing Prices Sept. 23 | Aug. 25 |
|---|---|---|
| A.P.W. Products | 3 | *2¾-3 |
| Celotex | 17 | 15⅞ |
| Same Preferred | 16⅝ | *16¼-17⅛ |
| Certain-teed Products | 13¼ | 12 |
| Champion P & F Co. | 24⅝ | *23⅝-24 |
| Same Preferred | 97 | *96-97⅝ |
| Chesapeake Corp. | 20½ | *18⅞-19 |
| Container Corp. | 36 | 33 |
| Same Preferred | 101 | *99-100 |
| Continental Diamond | 7½ | 7¼ |
| Crown Zellerbach | 27⅝ | 25⅜ |
| Same Preferred | 100⅝ | *99¾-101½ |
| Same $4 Preferred | 96¼ | 94 |
| Dixie Vortex | 31 | *28⅝-29 |
| Same "A" | 50 | —— |
| Eastern Corp. | 8⅝ | 8¼ |
| Robert Gair | 7 | 6 |
| Same Preferred | 17 | 17 |
| Gaylord Container | 19⅜ | 18 |
| International Paper | 58¼ | 54½ |
| Same Preferred | 101½ | 103 |
| Kimberly-Clark | 23¾ | 21⅜ |
| Same Preferred | 99½ | *100-103 |
| McAndrews & Forbes | 35½ | *33½-34½ |
| Marathon | 22 | 20 |
| Masonite | 48¼ | 47⅜ |
| Mead Corp. | 12⅝ | 12⅝ |
| Same Preferred | 89½ | *88-95 |
| Same 2nd Preferred | 30½ | *31-33 |
| National Container | 7 | 6⅝ |
| Paraffine Cos. | 19½ | *18¼-19 |
| Same Preferred | —— | *102¼-103½ |
| Rayonier, Inc. | 25 | 24¼ |
| Same Preferred | 31¼ | *31-31⅝ |
| Scott Paper | 60½ | 59 |
| Same $3.40 Preferred | 94⅜ | 96 |
| Same $4 Preferred | 106½ | *105¼-106½ |
| St. Regis | 7½ | 6⅝ |
| Same Preferred | 81½ | *81-82 |
| Sutherland Paper | 35 | *32½-33¾ |
| Union Bag & Paper | 24⅜ | 24 |
| United Board & Carton | 6⅞ | *5¾-6⅛ |
| United Wall Paper | 3¼ | —— |
| Same Preferred | 25 | *23½-25 |
| U. S. Gypsum | 98¼ | 94 |
| Same Preferred | 185 | *182-184 |
| West Va P & P | 41½ | 40⅜ |
| Same Preferred | 107 | 107 |

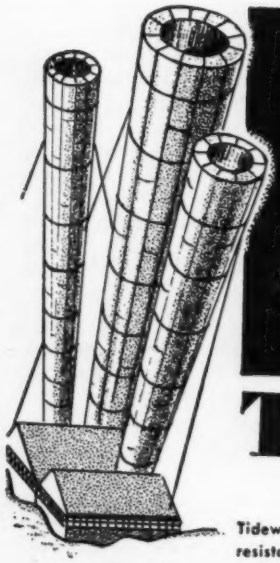
**New York Stock Exchange—Bonds**

| | | |
|---|---|---|
| A.P.W. Products 3% | —— | *69-70 |
| Celotex 3⅜% | 101 | 100½ |
| Champion P & F 3% | —— | *102½-103½ |
| Mead Corp 3% | 102 | 102 |

**New York Curb Exchange—Stocks**

| | | |
|---|---|---|
| Am Writing | —— | *5⅞-6 |
| Great Northern | 40 | 38¾ |

*Closing Bid and Asked Prices

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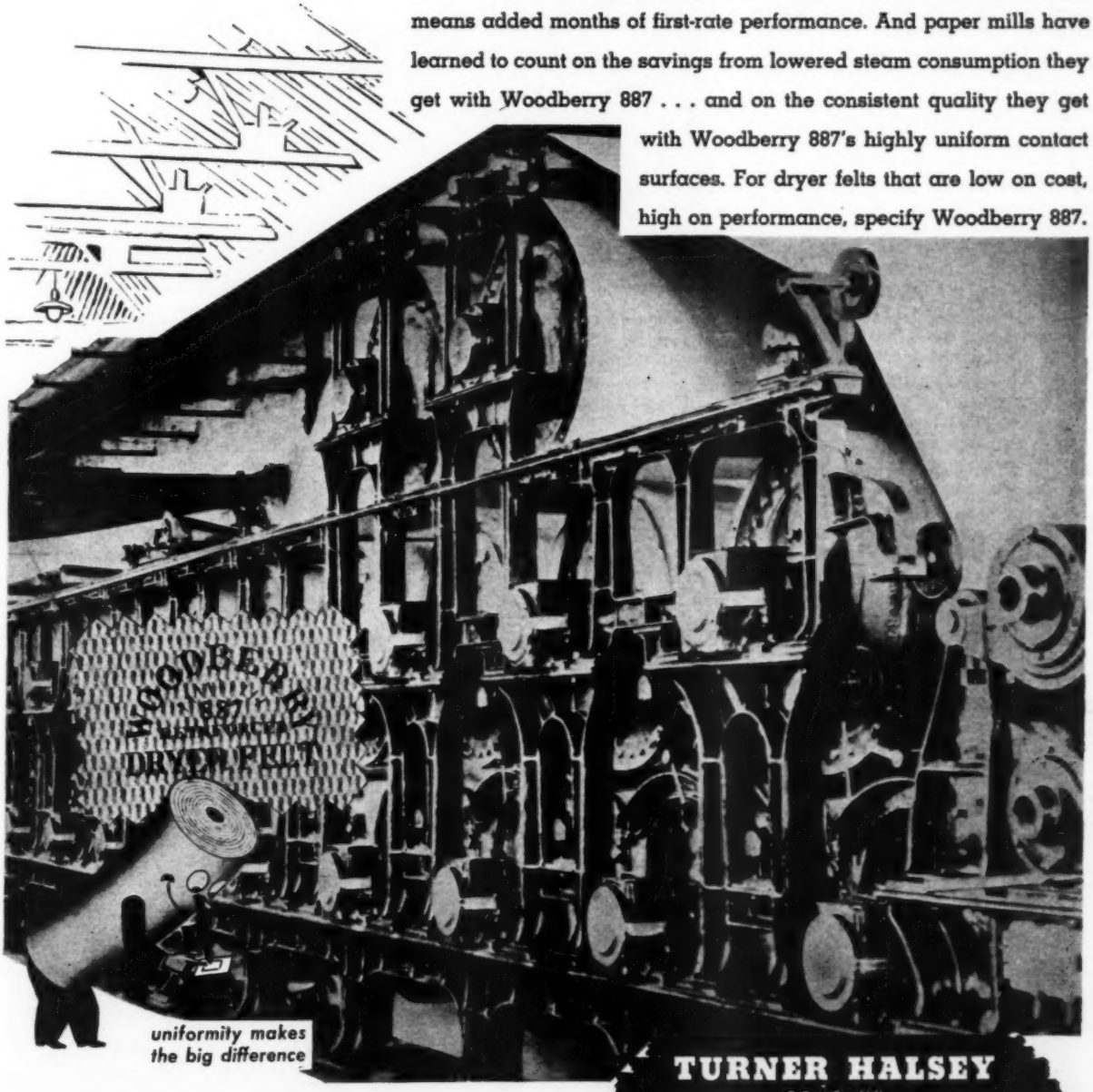
# Woodberry 887 Dryer Felts

**You'll find smoother operation and longer wear** in these reinforced heavy-duty dryer felts. Woodberry 887's patented feature—asbestos yarns woven at scientifically determined intervals into their face—means added months of first-rate performance. And paper mills have learned to count on the savings from lowered steam consumption they get with Woodberry 887 . . . and on the consistent quality they get with Woodberry 887's highly uniform contact surfaces. For dryer felts that are low on cost, high on performance, specify Woodberry 887.




*uniformity makes the big difference*

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# G-E Invites Paper Men

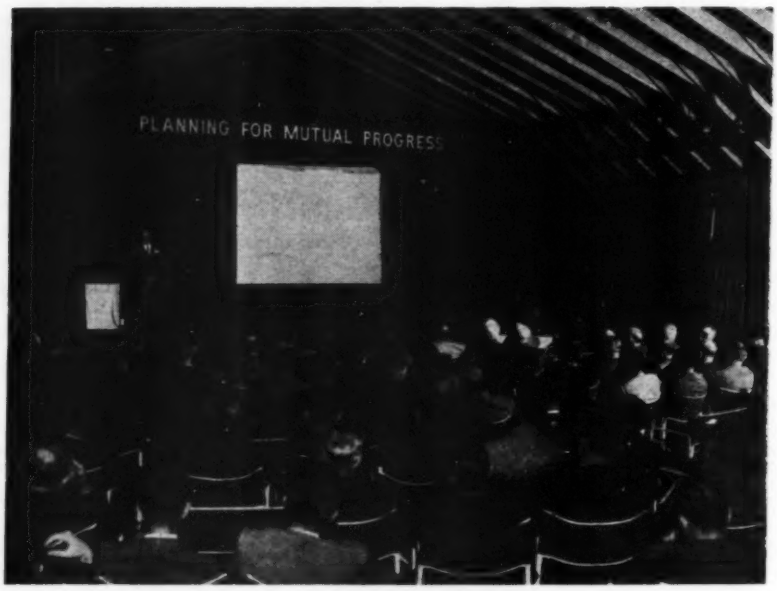
▶▶▶ THE FIRST PAPER INDUSTRY electrical conference, sponsored by the General Electric Company, was held at the Adirondack Inn, Sacandaga Park, New York, September 12 and 13. Approximately 150 invited representatives of the paper industry and executives of General Electric Company participated in the two-day program.

The purpose behind this unique gathering was that the paper industry and one of its major suppliers might consider together plans for their mutual progress to the end that both should contribute in ever-increasing measure to more of the things that make for better living—the American way of life.

The paper industry believes it has met the challenge imposed upon it by the demands of the war and its aftermath and that all markets have been served to the very best of its ability under such arduous times.

The General Electric Company in its desire to formulate a broader perspective of the times that are ahead, planned this Conference to bring together top management of the papermaking industry to sit with the leading executives of its own company, in the hope that each might draw from the other new strength and vision.

It is an accepted fact that the enviable productive record of the paper industry can be best preserved if new high levels of efficiency are constantly introduced. This, of course, brings many complications, but no other nation has industrial leaders better qualified to work out such problems. And behind these leaders are the skill and training of the American worker backed up by more machinery and more electrical horsepower than are available to any workers in any part of the world.




Circus room of Adirondack Inn as G-E Electrical Conference got under way

It was altogether fitting, then, that in line with modern trends, the Conference was concerned principally with the interests of top management. "Planning for Mutual Progress" was the general conference theme. The sessions were grouped under three sub-themes:

(1) Current Management Problems
(2) Mill Trends
(3) Looking Ahead Together

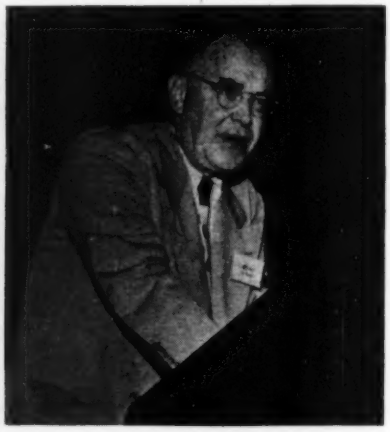
During the sessions devoted to these topics, a number of authorities presented papers that displayed careful preparation. There were many "case histories" illustrating how modernization and electrification are constantly increasing the productivity of paper mills. Some discussed proven management policies resulting in economy. Others gave something of a preview "What's Ahead in Research."

At the first session of the Conference, visitors were welcomed in behalf of the General Electric Company by K. R. Ross, manager of the Manufacturing Industries Division.

G-E speakers on the program of the session devoted to Current Management Problems were C. H. Lang, company vice president; C. L. Kenyon, manager Credit & Collection Div.,

K. R. Ross, of General Electric, welcomes the visitors

R. B. Robertson spoke on Mutual Progress at opening session



What the paper industry expects from G-E was answered by J. B. Eakin

# to Electrical Conference

M. S. Fogarty (L), Sutherland Paper Co., and Chester H. Lang, of General Electric

Executive Department; H. L. Erlicher, company vice president; and W. V. Merrihue, manager Employee & Community Relations.

Mr. Lang's subject, "The Salesman's Market," touched the pulse of buyers of electrical equipment. He said that the backlog of orders has about been dissolved but that there are *no* indications of either a bust or a panic, or a depression, if we keep our heads. Since the salesmen of a decade ago in the paper industry as well as the electrical industry have moved to other jobs, today's salesmen have learned their trade under rosy conditions. Mr. Lang's formula for regaining sales volume is the selling slogan *"call, call, call—in order to sell, sell, sell."*

## Financial Aspects . . .

C. L. Kenyon, manager Credit & Collection Div., Executive Department, G-E, spoke on "Financial Aspects of Capital Improvements." In part, he said:

"Back in the early thirties, the paper industry began a program of great expansion. . . . In spite of the then unfavorable economic outlook, the paper industry had the courage and foresight to carry through this program which not only added greatly to its capacity but added tremendously to its capitalization and debt. . . . Because of improvements in electrical and other equipment, this new capacity promised increased production beyond the proportion of the increased physical properties, and resulted in economies in operation.

"The industry now has improved facilities acquired at low cost, which it has been able to wholly or partially amortize, and having this capacity it was able to take advantage of increased sales opportunities. One result is that it is in sounder financial position today than ever.

"Facing an optimistic future, the big questions seem to be when should integration and improvement of production facilities be carried forward? When is the most economical time?

"All tendencies toward higher costs may be offset by technological progress and economies in production. But the way things are shaping now, higher rather than lower costs are indicated. But how does this apply to industry? It suggests to me that we would be just as unwise to hold off necessary plant construction now, awaiting lower costs, as we would have been unwise to have done so during the 1930s. We may have temporary lower prices in some industries and at the same time higher prices in some lines. This would depend upon competition and current need for volume, but in the end, costs will establish selling prices. As to capital, there is plenty of it available for those who qualify. The larger our capital reservoir, the greater the opportunity to finance new construction."

J. W. Roberts (L), Johns Manville, and E. F. Bearce, Chillicothe Paper Co.

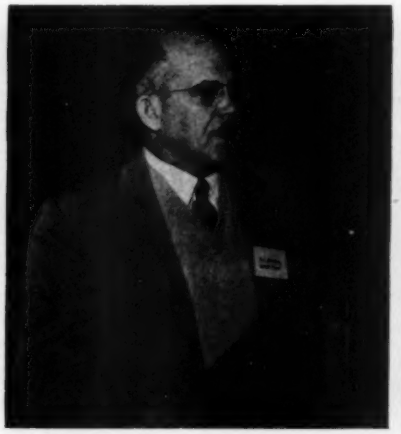
## Many Million $$$$$ Interest

The strong alliance between the paper industry and the electrical industry was the theme of address given by H. L. Erlicher, G-E vice president, on the subject "Our Many Million Dollar Interest in Your Industry." Excerpted here are some of the salient points:

"Paper and paper products in their many forms contribute directly to making better electrical products. We have a very important stake in your industry, one that can mean millions of dollars to us. On the other hand, our purchases of paper products for insulation, boxing, packaging, and stationery run 10 to 15 million dollars per year and are used in an endless variety of our products. This annual purchase of paper represents a freight train longer than from here to Schenectady and back—a distance of 75 miles.

"At the same time, the electrical industry's development of motors, control equipment, electronics, and other

D. H. Putnam stated some conference objectives at Mill Trends Session



B. L. Kassing spoke on Quality Control with Process Instrumentation

G. W. E. Nicholson's subject was Modern Trends at Looking Ahead Together Session

products has contributed considerably to the art of papermaking. Like "ham and eggs," our two industries belong together, and we can really be of great help to each other.

"Within our Purchasing Department we have established a value Analysis Division, whose job is to study our products to determine if every part and every material going into them represents full value to us. We believe that your industry can be of much importance to us through the medium of the Value Analysis program, by helping us to develop new and better paper products, recommending places where we can substitute different grades and types of paper for the material now in use.

"People from the steel, aluminum, and glass industries study our problem in this way, and in many cases have given us a better product, at a better cost, and also increasing their business. I could go on citing many cases where substitutions have been made and how many more materials have come to our attention as substitutes because of aggressive representatives who were completely familiar with our needs and who knew their own products so completely that they immediately determined new applications for us to consider.

"I would like to point out one particular problem with which we have been confronted, especially during those times when we have had a seller's market. That problem is not being able to get specialty papers, which are more difficult to manufacture and which possibly carry a smaller profit margin than some other type papers which can be turned out in large quantities and are more profitable to you. A situation such as this makes it difficult for us to make progress, and I urge you to give this matter serious thought. There is always the possibility and probability that our usage will expand on these types of papers, so that a small volume item soon becomes a very profitable large volume product. For example, a paper which we use in motor insulation had such a humble beginning. It was tested in our own laboratory with only a minor application in mind. Test results developed many new applications, and today that specialty paper amounts to a volume running into tens of thousands of dollars per year."

After one of the business sessions, J. H. Ford, Container Corp. of America; J. McWilliams, Byron Weston Co., and F. M. Roberts, of G-E, enjoyed a round of golf

## Value of the Employee

The relations of employer to employee was the basis of address by M. V. Merrihue, manager Employee & Community Relations, G-E Co. His subject, "Some Hopeful Experiments in Employee Relations." With fluent, extemporaneous remarks, Mr. Merrihue stressed the part of the employee in the present-day industrial picture. He said that management places its relations with employees as one of its first and most important problems.

## Voice of the Paper Industry

Four representative speakers identified with top management of well-known paper companies, spoke of the industry's trends, its expectations, its devotion to free enterprise, and its dependence upon instrumentation for quality control.

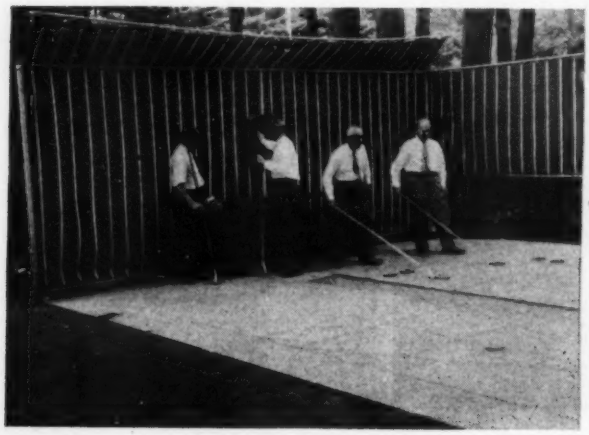
### R. B. Robertson

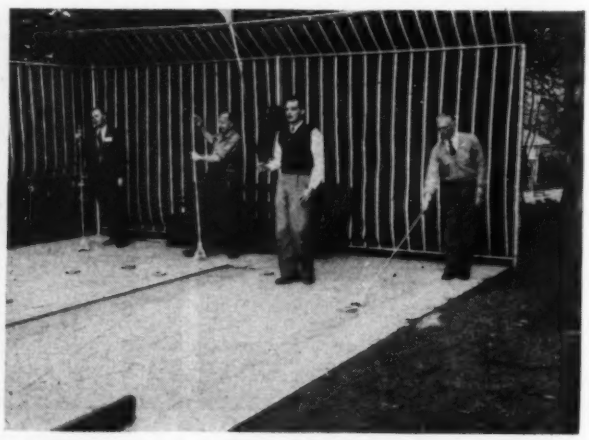
At the first session of the Conference, programmed to consider the theme Current Management Problems, R. B. Robertson, president of The Champion Paper & Fibre Company, and a past president of the American Paper and Pulp Association, delivered an address on the subject "Mutual Progress Means More Progress." The speaker said in opening his talk that he stood for the principle stated in his subject "whether it applied to the relation between men and management, between industry and the community, or between the user and the supplier of industrial equipment." Mr. Robertson believes that there will be a recurrent challenge to our system of free enterprise. To meet this, every industry must put its house in order and not only drive for the greatest technical efficiency, but also for the highest possible recognition of its social responsibilities.

He pointed out that one of the cornerstones on which mechanization is built is the availability of electric power at modest cost. In our modern, mechanical age, electric control devices, together with power produced economically are found at the very heart of most of these improvements.

### J. Bryce Eakin

It was appropriate that a purchasing agent of one of the large paper manufacturing companies should treat the





Shuffleboard was one of the favorite sports enjoyed by visitors

A group at croquet . . . Adirondack Inn is seen in background

Golf was enjoyed by many groups

subject "What the Paper Industry Expects from the General Electric Company." Mr. Eakin, who is purchasing agent of St. Regis Paper Company, brought the expectations indicated by his subject into four words: quality, price, service, and co-operation. He said he considers these words to comprise the four principal parts essential in his formula of a good purchasing policy. Mr. Eakin spoke forcefully of breakdowns which are costly and disrupt production. He was emphatic in his statement that equipment must be of superior quality to minimize such breakdowns. When these happenings are unavoidable, he pointed out that the paper mills expect the equipment manufacturer to supply replacement parts quickly. Preventive service calls were mentioned as "a stitch in time."

### B. L. Kassing

During the second session devoted to Mill Trends, the subject of "Quality Control with Process Instrumentation" was covered by B. L. Kassing, general manager of manufacturing, Ecusta Paper Corporation. In the beginning, the speaker sketched the growth of the paper industry to its present level of control and instrumentation. Retrospectively, Mr. Kassing pictured the wedding of instrumentation to a romantic ancient art. He pointed out that process instrumentation can be completely effective only when our materials are uniform, or if not uniform, pre-tested. Processing equipment also should be standardized. Barring the effects of material and equipment variation, it is probably safe to say that we can control our pulping processes within fairly narrow limits. The speaker said that we are making headway in our papermaking processes, but we are not nearly as advanced as in pulp mill processes.

Mr. Kassing asserted that there are still unexplored fields open for instrument control. He mentioned three factors he considered most important from the standpoint of Quality Control, not one of which he believed are satisfactorily controlled:

(1) Freeness or degree of beating the stock; he did not know of any instrument which truly measures and records the most important variable. Instruments are needed for this purpose.

(2) Stock consistency with its resultant effect on sheet weight.

(3) Product Quality. Speaker felt the industry would welcome some device which would serve as a "control eye"—something to search out defects on a paper web or point out "spots and specks" which, he believed, will plague papermakers until some mechanical or electrical device can perform what would now be considered "out of control."

### G. W. E. Nicholson

At the last session of the second day, several papers were presented following the theme "Looking Ahead Together." For the paper industry, G. W. E. Nicholson, vice president and general manager of the Union Bag & Paper Company, also a past president of the Technical Association of the Pulp and Paper Industry, spoke on the subject "Modern Trends in Pulp and Papermaking."

Taking his audience on a figurative tour of one of the new southern mills making unbleached kraft pulp and paper, Mr. Nicholson pointed out the latest developments in papermaking machinery. From the woodroom, through all phases of the manufacturing process to the finished product, the speaker visualized the progress that has been made through new and more modern machines and processes achieved through research. He referred to the progress made in the modern paper machine drive, particularly the great progress made in the development of a dependable high speed electrical sectional drive using electronic control.

Mr. Nicholson believed he was correct in stating that the pulp and paper industry is in the unique position among major industries in our country in that it ranks first in power used per ton of finished product—approximately 700 kwh—and third in installed generating capacity of 1,600,000 kw. Because of this fact, he said the paper industry and the electrical field would always be very closely tied together.

### Diversion Activity

Although the visitors were at the Conference in consideration of its business aspects, everything had been done to fill in whatever time could be spared for diversion. The beautiful Adirondack region made an ideal setting for such a gathering and the General Electric Company proved an incomparable host. The meetings were held in the Circus Room at the Inn.

The dinner given at the Inn on the evening of the first day was a festive occasion. Presiding as Master of Ceremonies was G-E's F. W. McChesney who kept the events of the evening moving with zest and spontaneity. Prizes for the sports events were awarded following the dinner.

### Subjects Presented at G-E Electrical Conference

**Current Management Problems**

**The Salesman's Market,** by C. H. Lang, vice president, General Electric Co.

**Mutual Progress Means More Progress,** by R. B. Robertson, president The Champion Paper & Fibre Co.

**Financial Aspects of Capital Improvements,** by C. L. Kenyon, manager Credit & Collection Div., G-E Co.

**Our Many-Million-Dollar Interest in Your Industry,** by H. L. Erlicher, vice president, G-E Co.

**What the Paper Industry Expects from the G-E Co.,** by J. B. Eakin, purchasing agent, St. Regis Paper Co.

**Some Hopeful Experiments in Employee Relations,** W. V. Merrihue, manager Employee & Community Relations, G-E Co.

### Mill Trends

**Higher Mill Efficiencies and the New Gas Turbine,** by W. C. Bloomquist, Industrial Engineering Div., G-E Co.

**More Usable Power, Greater Protection and Better Service Continuity Applying Modern Distribution Practices,** by D. L. Beeman, manager Industrial Power Div., G-E Co.

**Protect Your Personnel and Equipment Throughout the Mill,** G. W. Knapp, manager Paper & Textile Div., G-E Co.

**Less Work for the Operator Means More Production,** by G. E. Shaad, Paper & Textile Div., G-E Co.

**Quality Control with Process Instrumentation,** by B. L. Kassing, general manager of manufacturing, Ecusta Paper Corp.

**New Horizons Using New System Techniques,** by W. Mikelson, Paper & Textile Div., G-E Co.

**Wood Handling,** by A. P. Schnyder, paper mill engineer, Ebasco Services, Inc.

**Why Pay More to Handle Your Materials?** by D. H. Putnam, manager of sales, Lumber & Paper Ind. Sec., G-E Co.

### Looking Ahead Together

**Our Part in Your Future,** by W. V. O'Brien, general sales manager, Apparatus Dept., G-E Co.

**Profit by Project Co-ordination,** by K. R. Ross, manager Manufacturing Industries Div., G-E Co.

**Engineering Co-operation and Mutual Assistance,** by A. K. Bushman, manager, Application and Service Engineering, G-E Co.

**Modern Trends in Pulp and Papermaking,** by G. W. E. Nicholson, vice president and general manager, Union Bag & Paper Co.

**What's New in Research?** by Dr. C. G. Suits, vice president, G-E Co.

**Can We Plan on Atomic Power?** by H. A. Winne, vice president, G-E Co.

[*NOTE: Abridgments of some of the papers presented at this conference appear elsewhere in this issue. See Contents Page.*]

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## GAIR AND REYNOLDS COMBINE OPERATIONS FOR MAKING A LAMINATED FOIL CARTON

Arrangements have been made whereby the foil carton manufacturing activities of the Reynolds Metals Company will be carried on by the Robert Gair Company, in association with Reynolds, to produce an expanded line of packaging to be known as "Gair-Reynolds Foiline" folding cartons. The announcement was made by J. Louis Reynolds, vice president of Reynolds Metals, and Norman F. Greenway, vice president of Robert Gair Company, Inc., both of New York.

Reynolds will turn over to Gair its techniques for laminating and printing foil and will lease to Gair some of the necessary machinery for laminating foil and paperboard and will supply Gair with its requirements of foil. The machinery will be installed and operations conducted by Gair in its folding carton plant at Piermont, New York. The result will be a completely integrated aluminum foil carton manufacturing operation with all phases of manufacture incorporated from the paperboard to the finished carton, including multicolor printing. Reynolds Metals will also make available to Gair, in the future, any improvements in printing techniques which it develops in its plants.

Richard T. Clark, formerly manager of the Carton and Container Division of the Reynolds Metals Company, has joined the Gair Company to assist in carrying out this manufacturing and sales program.

This move greatly widens the market front for foil cartons in numerous industries.

Paper Products Div., of Portco Corp., New Vancouver, Wash., which opened at new location a short time ago. Plant formerly was located in Camas, Wash., under name of Perfection Twine Co.

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## BOX PLANT WILL BE BUILT TO CONNECT WITH OPERATIONS OF PORT ST. JOE PAPER CO.

In collaboration with the St. Joe Paper Company, Port St. Joe, Florida, the Florida Fibre Box Company, of Sarasota, Florida, has announced plans for a large corrugated box factory. A later announcement reveals that the contract has been awarded to the Austin Company, of Houston.

W. T. Edwards, vice president of the St. Joe company, states that the new plant, which is an outgrowth of experiments aimed at developing new citrus and vegetable containers, will contain approximately 50,000 ft. of floor space. Total cost of the project has not been disclosed. It was stated, however, that it will be connected with the present paper machine room.

▼

## CELANESE CORP. IS GIVEN CHEM. ENGINEERING AWARD

The winner of the Chemical Engineering Achievement Award for the year 1949 is the Celanese Corporation of America. A committee of more than fifty senior educators from leading colleges and universities in 26 states voted the distinction to Celanese in recognition of the company's outstanding program of post-war developments in the chemical, textile, and plastics industries. Presentation will be made at a dinner at the Waldorf-Astoria Hotel on December 1.

The Award was founded by McGraw-Hill Publishing Company in 1933 for the purpose of recognizing meritorious group achievement and of calling attention to progressive companies that have encouraged broader participation of chemical engineers in affairs of the process industries. Celanese is the eighth corporation to be so honored. It has been given in recent years for such accomplishments as the harnessing of atomic energy and the development of synthetic rubber.

Celanese Corporation was especially cited for its development in petroleum chemistry, as well as for its achievements in the field of cellulose chemistry.

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▶▶▶ A STOCKPILE of baled paper burst into flame August 19 at the Robert Gair Company of Canada, Toronto, Ontario, and destroyed 200 tons of paper, a beating shed, and storage space. Loss was unofficially estimated at $100,000.

▼

## CHAMPION WINS OSCAR

For the second consecutive year, the annual report of The Champion Paper and Fibre Company, Hamilton, Ohio, was judged the best of the pulp and paper industry by an independent board of judges for *Financial World*. More than 4,500 corporation annual reports were submitted in this national survey (the ninth in the series), and these were judged in one hundred industrial classifications for "best of industry" awards. In the "pulp and paper industry" category, Kimberly-Clark Corporation, Neenah, Wisconsin, was runner-up for top honors, while International Paper Company, New York, took third place.

The bronze "Oscar of Industry" trophy will be presented by Weston Smith, executive vice president of *Financial World* and originator of the annual report surveys, to Dwight J. Thomson, Champion's vice president of industrial and public relations, at the annual awards banquet in the Grand Ballroom of the Hotel Statler, New York, on October 31, 1949. More than 1,000 business and financial executives from all over the country will attend.

# Two Outstanding New Installations on the Pacific Coast

Two new Puseyjones Machines are now in operation on the Pacific Coast—at the East Antioch mill of Fibreboard Products, Inc.; at the Tacoma mill of St. Regis Paper Company. New in design . . . new in outstanding features . . . new in high speed, large tonnage production. Whatever your papermaking problem may be, we will gladly show you what's new in Puseyjones Machines and what's on the boards for the future.

**THE PUSEY AND JONES CORPORATION**
**Est. 1848. Builders of Papermaking Machinery**
**Wilmington 99, Delaware, U.S.A.**

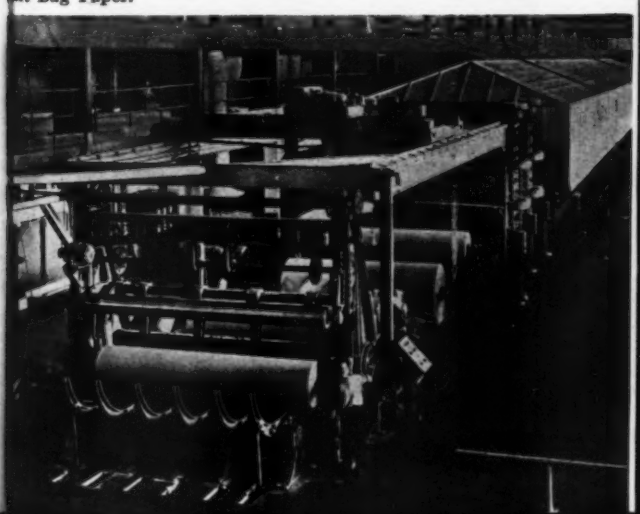
THE SIGN OF TRADE MARK SUPERIOR QUALITY

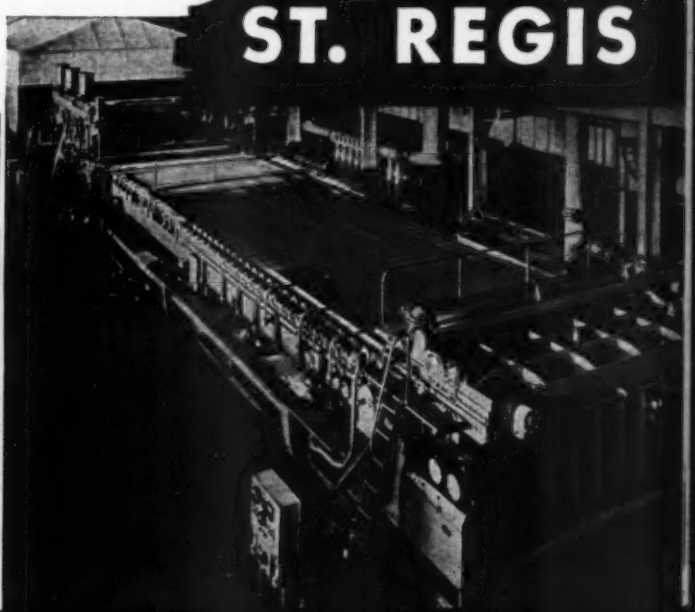
## FIBREBOARD

Two views of new Puseyjones Machine at Fibreboard Products, Inc. East Antioch, California. Wire width is 156 inches. Capacity is 125 tons of corrugated liner per day.

## ST. REGIS

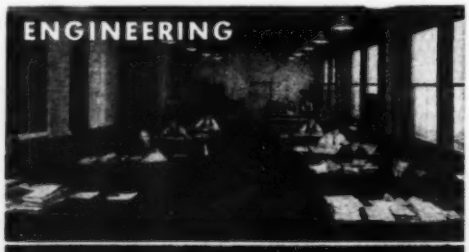
wo views of 180" Puseyjones Fourdrinier Machine at Tacoma, ashington mill of St. Regis Paper Company. Designed and con-ucted for top speed of 2100 F.P.M. making high-test multi-wall aft Bag Paper.

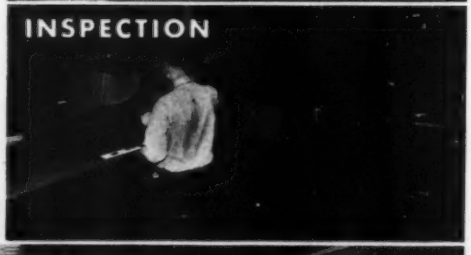


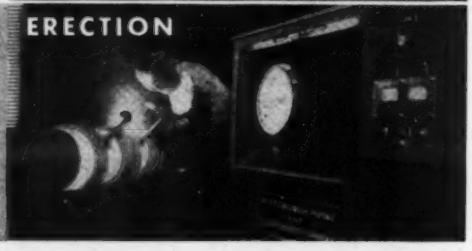


# There's Only 1 RESPONSIBILITY

**WHEN YOU TURN THE COMPLETE POWER PIPING JOB OVER TO P. P. & E.**






Simplify responsibility on your next power piping installation—entrust the complete job to P.P.&E. These are a few of the advantages:

- Far less detail work for you.
- Correct interpretation of blueprints.
- Efficient detailing of shopwork for best coordination with field requirements.
- Maximum amount of system prefabricated, stress-relieved, model tested, as well as tested under ideal shop conditions.
- Field erection supervised by specially-trained personnel with a minimum of waste motion.

All these responsibilities—and many others—are made into one . . . *ours* . . . when the *complete* high pressure piping contract is turned over to us. Consult our nearest representative for futher information.

*Pittsburgh Piping*

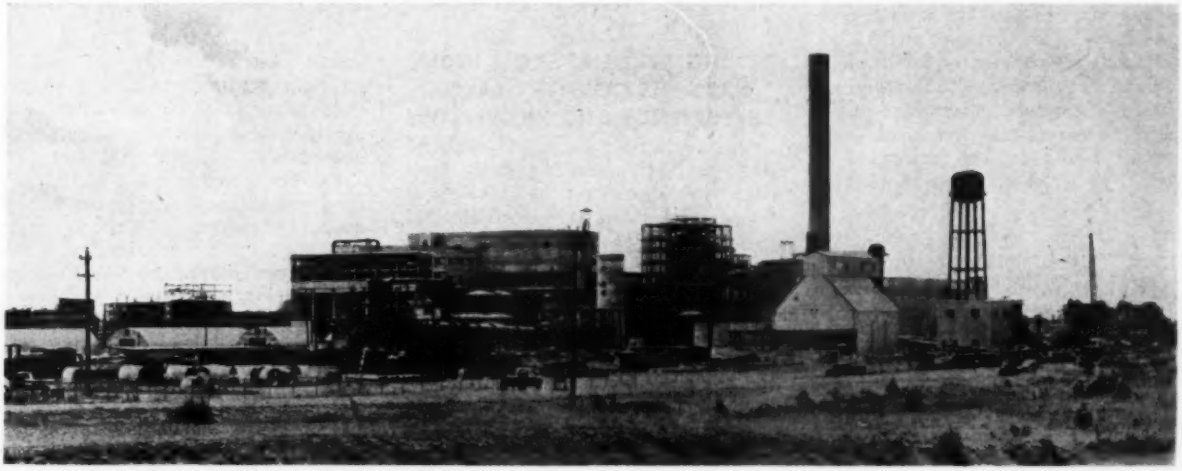
**AND EQUIPMENT COMPANY**

*10 Forty-Third Street—Pittsburgh, Penna.*

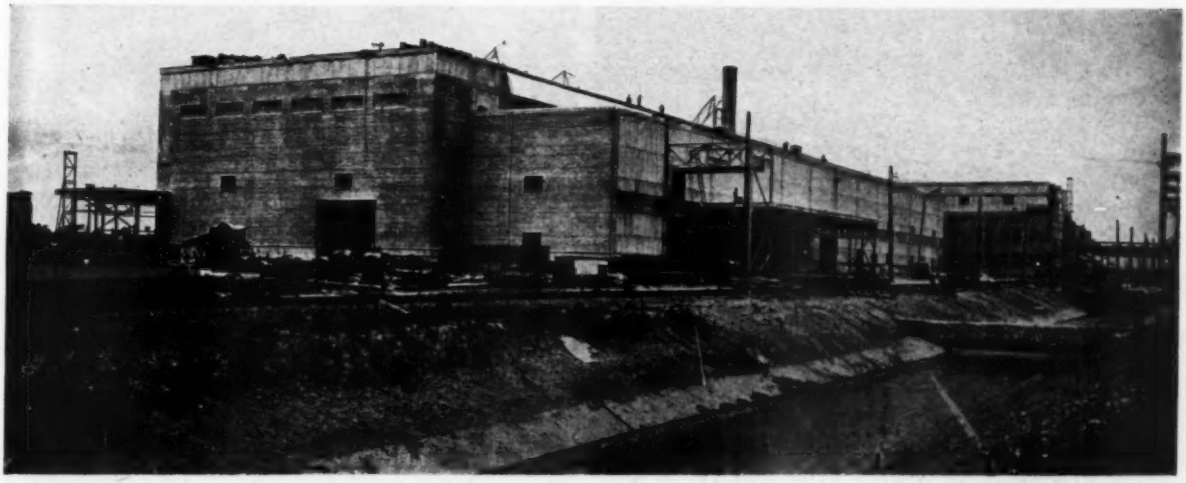
Woolworth Building, New York
Whitehead Building, Atlanta
Book Tower, Detroit
525 Market Street, San Francisco
Peoples Gas Building, Chicago
Public Square Building, Cleveland
10 High Street, Boston
Heights State Bank Bldg., Houston

# Recent Views of Coosa River Newsprint Plant

Front view of Coosa River Plant, Coosa Pines, Alabama. Paper mill building in foreground. Shipping platform at right



Rear view of the mill emphasizing sulphate pulp mill section with lime kiln and causticizing unit in foreground



Another view of the mill with that end of the paper mill building containing machine room and pulp dryer room in the foreground

## FLASH!

As this issue is closing, an important press report (unconfirmed) states that General Lucius D. Clay, formerly commander of U. S. Armed Forces in Europe, has become president of Ecusta Paper Corporation, Pisgah Forest, North Carolina, as of October 1.

Harry H. Straus, founder and president of the corporation, has become chairman of the board.

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## PLANS STILL UNDER WAY FOR DISSOLVING PULP MILL TO BE BUILT AT DUNCAN BAY, B. C.

The Canadian Western Lumber Company, Vancouver, British Columbia, plans to go ahead with its pulp mill project at Duncan Bay, British Columbia, according to Robert Filberg, vice president of the company, in a recent talk before a service club meeting at Campbell River. The project is planned as a 300 ton per day dissolving pulp mill, to cost approximately $35,000,000 to $40,000,000 (Cf P. I. and P. W., Jan., 1948, p. 1410).

No date has been set for breaking ground, but the CWL contract with the British Columbia government for a forest management license on Vancouver Island expires December 31, 1952, if actual construction has not begun then.

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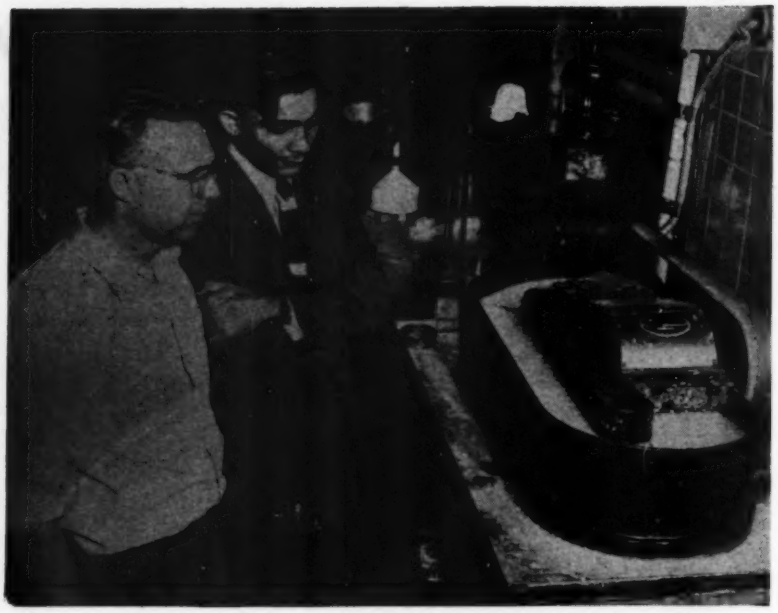
▶▶▶ THE OPENING of a new multiwall bag sales office in New Orleans, Louisiana, was recently announced by the Union Bag & Paper Corporation, New York. Herman R. Ninesling, formerly of the New York multiwall sales office, will represent the company in the states of Louisiana and Arkansas, and will make his headquarters in the New Orleans office.



Rasik Acharya (R), is shown watching the operation of a model paper mill beater in the chemical laboratory at the Falls plant of Mando. R. J. Burrock, chief chemist, explains the equipment

## YOUNG STUDENT FROM INDIA SAYS HIS COUNTRY LACKS EXPERIENCE AND KNOW-HOW

A student from India, who is studying chemical engineering at the University of Wisconsin, and who recently spent several days studying pulp and papermaking processes at the International Falls plant of the Minnesota and Ontario Paper Company, has shown special interest in our modern research, in chemical laboratories, and in processes developed in this country for the utilization of by-products.

Rasik Acharya is 28 years of age and is among 1,000 young technicians studying in the United States at the present time under the auspices of the Indian government. He says "India's greatest shortcoming not only in papermaking, but in all major industries, is the lack of experience and technical know-how."

According to this young student, the foreign study program of the Indian nationalist government was established to fill a desperate need for engineers and technicians in a country that is aggressively striving for economic and social progress.

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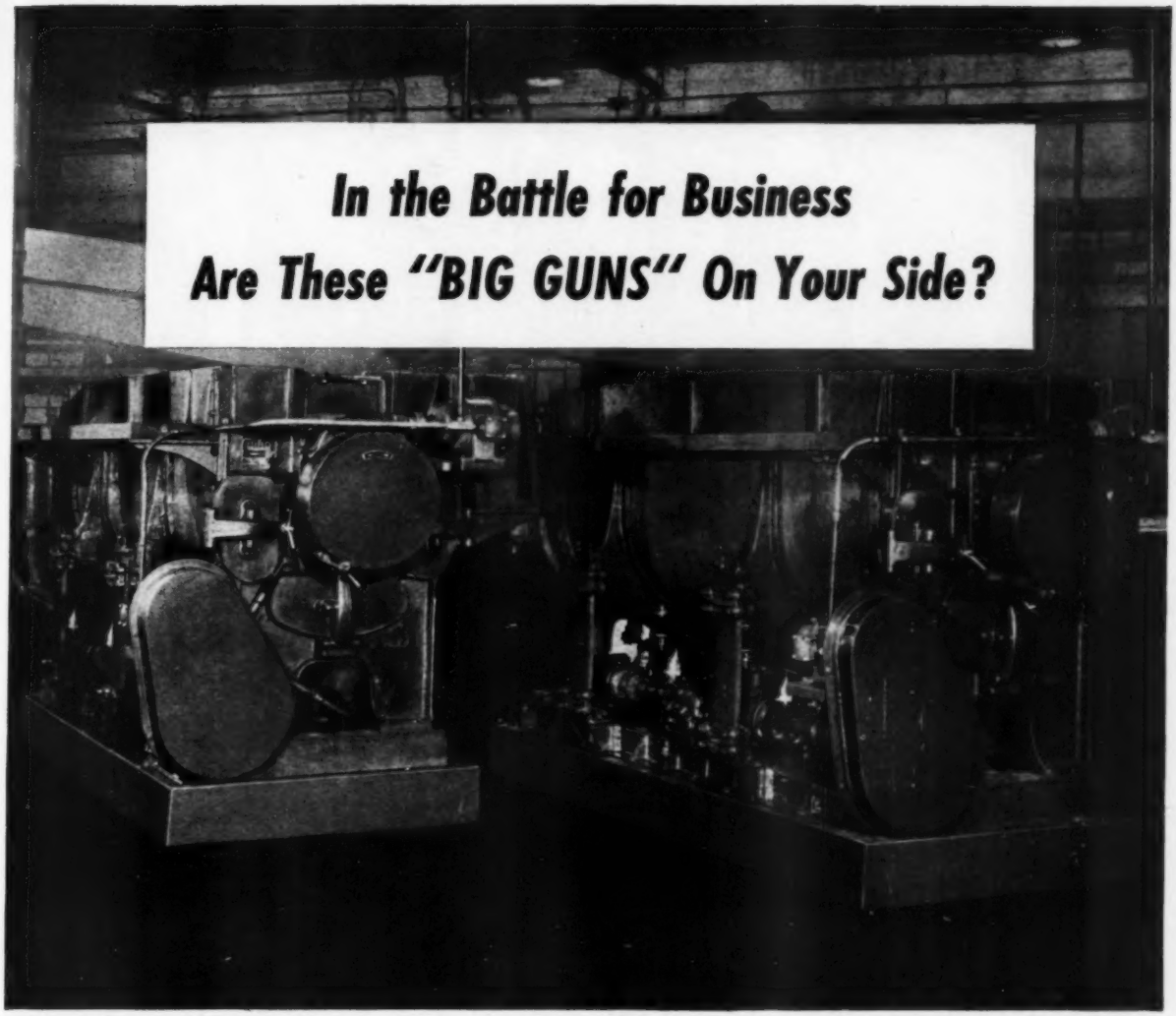
▶▶▶ CONSTRUCTION OF facilities to produce bleached sulphite pulp have begun at the Bellingham, Washington, plant of the Puget Sound Pulp & Timber Company. Estimated to cost

NEW DISSOLVING PULP MILL of the Columbia Cellulose Co., Ltd., being erected on Watson Island, B.C., progressing rapidly. Shown here is a general view of digester and pulp washing building. All steel construction is completed, and office building will be ready for occupancy within a few weeks (Cf. P.I. and P.W., Sept., 1949)

Laying of a pipe line to bring ample water supply from nearby lakes created an engineering problem for the company in construction of its high alpha pulp plant on Watson Island. Note concrete base and heavy reinforcing arch at entrance to one of three tunnels through which the pipeline passes



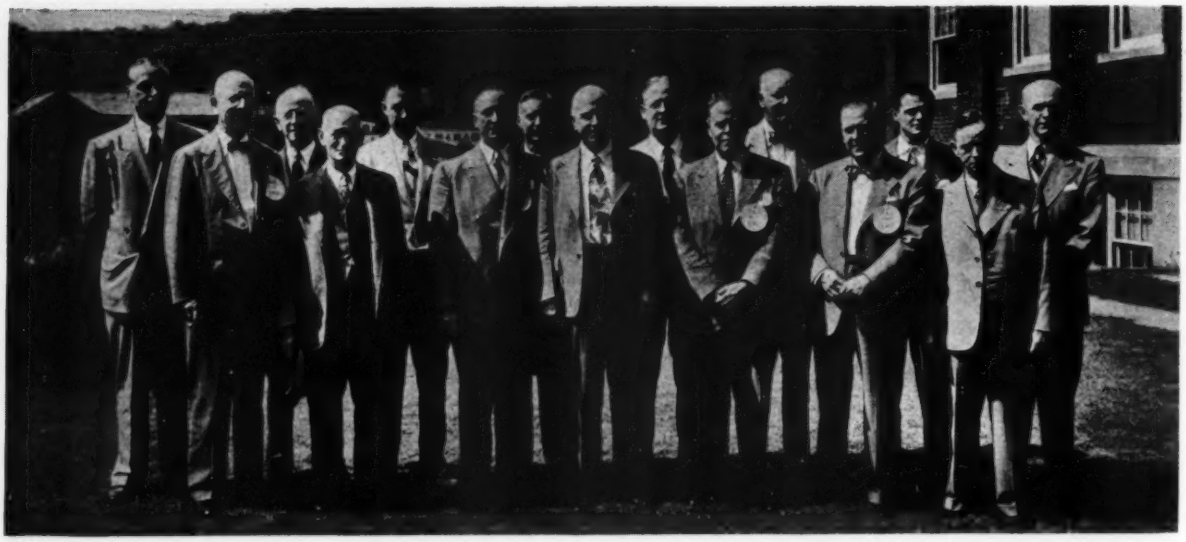

DROP-OFFS ARE DONE AWAY WITH at the wet end of board machines when Bird Screens like these go on the job. With today's high speed operation drop-offs are too costly to tolerate. That's one reason why board mills all over the continent are putting in Bird Screens.

Big, modern Bird Screens are potent protection against loss of business due to lack of quality. With paper buyers casting critical eyes on the cleanness and uniformity of every sheet, this is no time to limp along with outworn or inadequate screening equipment.

Take a look at *your* Screens, now. If you have any doubt about their ability to do today's job efficiently and economically, get in touch with us at once.

**BIRD MACHINE COMPANY, SOUTH WALPOLE, MASSACHUSETTS**

**90% OF ALL THE PAPER MACHINES IN NORTH AMERICA ARE EQUIPPED WITH BIRD SCREENS**



Strathmore Advisory Council Meeting: Front Row—W. E. Porter, Cook-Vivian Co., Inc., Boston; Fred Schlosser, Schlosser Paper Corp., New York City; Eric A. Rohrer, Swigart Paper Co., Chicago (chairman of Advisory Council); George E. Williamson, president of Strathmore Paper Co.; Guin C. Olson, Nackie Paper Co., Milwaukee; A. H. Martins, Alco Paper Co. Inc., New Orleans; G. E. Castle, Jr., Castle Paper Co., Lynchburg, Va. . . . Back Row—Harry E. Riggs, vice president in charge of sales, Strathmore Paper Co.; O. W. Mielke, Blake, Moffitt & Towne, San Francisco; T. H. B. Smythe, L. N. Smythe Co., Philadelphia; Robert Schmidt, Miller & Wright Paper Co., New York City; James D. Bligh, Barton, Duer & Koch Paper Co., Washington; W. N. Stetson, Jr., Storrs & Bement Co., Boston; Jack Green, Carpenter Paper Co., Omaha; H. J. Foulds, The Alling & Cory Company, Rochester

$1,250,000, the project is scheduled for completion by mid-1950. The company today makes only unbleached sulphite pulp, for which demand and price has contracted sharply in recent months.

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## STRATHMORE PAPER CO.'S ADVISORY COUNCIL MEETS WITH MANAGEMENT GROUP

Members of the Strathmore Advisory Council met on September 15-16 with members of the Management Group of the Strathmore Paper Company at Strathmore Community Building in Woronoco, Massachusetts, for business meetings.

The Advisory Council is composed of 12 members representing the 140 distributors of Strathmore papers throughout the country, together with the immediate past chairman of the Advisory Council. These members are elected from among the Strathmore merchants in the north, central, northeast, central Atlantic, southeast, south central, and Pacific coast sections of the country.

The objectives of the Advisory Council, which was established in 1932, are to exchange information, discuss problems of mutual interest and to cultivate the friendly relations and mutual confidence which exists between the mill and its distributors.

The group was welcomed on the morning of the first day by George E. Williamson, company president, followed with addresses given by Strathmore executives and department heads on sales, manufacturing, product development, service, advertising and sales promotion, and a talk on the company's reputation, both nationally and internationally, given by Abbott Kimball, president of the Abbott Kimball Company, New York City, advertising counsel for Strathmore.

At noon of the first day, the company gave a clambake for the group at Strathmore Park, followed by sports and entertainment.

The program of the second day forenoon included talks on inspection, quality and research given by Strathmore executives, as well as one on envelopes and converting by J. A. Chadbourne, president of Old Colony Envelope Company, Strathmore's official converter. This was followed by open discussion.

The afternoon of the second day was devoted to golf for the men and sightseeing trips for the ladies.

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## PULP AND PAPER COURSE IS AGAIN OFFERED BY BROOKLYN POLYTECHNIC

An up-to-date course in pulp and paper technology is being offered this fall by the Graduate School of the Polytechnic Institute of Brooklyn, Borough Hall, Brooklyn, New York. Graduate chemical engineers and others with an equivalent background will be eligible for the course to be given on Friday evenings from 8 to 10, continuing through the fall and spring semesters. The first lecture was given on Sept. 23.

Professor Robert S. Aries and Dr. Arthur Pollak, a consultant in this field, and for many years the director of the development department of the West Virginia Pulp and Paper Company, will be the lecturers.

A course on Printing Ink Technology will be given on the same evenings from 6 to 8 by Dr. Everett Carman, consultant and formerly with the Interchemical Corporation, New York.

▼

## PRODUCTION RECORDS ESTABLISHED BY GREAT LAKES PAPER COMPANY

A world's record for production from one paper machine and a mill record for output from two machines was established August 25 by the Great Lakes Paper Company Limited plant, Fort William, Ontario, Canada.

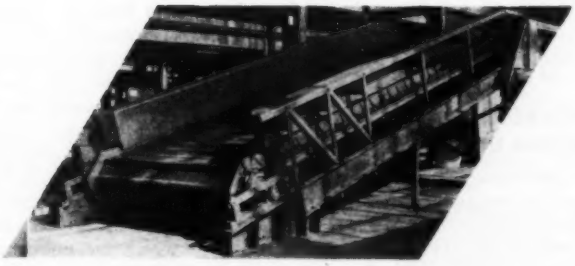
In a 24-hour period two machines at the plant turned out 593,067 lb of newsprint to top the previous mark of 496,535 lb established August 10. The No. 2 machine, the larger of the two at the plant, topped its previous world mark with 268,053 lb of newsprint in a 24-hour run. The previous one-day mark was 262,822.

▼

▶▶▶ APPOINTMENT OF T. Rasmussen & Company, Ltd., 14 St. Paul's Churchyard, London, as exclusive sales representative for the British Isles and Europe to sell any kraft liner manufac-

## *CONVEYORS....*

The only way to get maximum results out of a Hydrapulper is to keep it going full blast—and that means a suitable conveyor ahead of it. ¶Conveyor-feeding



means more even stock-delivery, faster stock-delivery, greater tonnage extracted or dumped. ¶Shartle builds conveyors, witness the shop view of one here shown. Shartle would be glad to figure with you on any type you may require. ¶Write for *Bulletin 96-S.*

**SHARTLE BROS. MACHINE COMPANY, Middletown, Ohio**

DILTS MACHINE WORKS, FULTON, NEW YORK
Divisions of THE BLACK-CLAWSON COMPANY, HAMILTON, OHIO
Western Sales Office: Mayer Building, Portland, Oregon
Associate: Alexander Fleck Limited, Ottawa, Ontario, Canada
Subsidiary: B-C International, Ltd., 16 Catherine Place, Victoria, London S.W.1, England

KOHLER SYSTEM EQUIPMENT
PRODUCT OF DILTS

tured by the Southern Paperboard Corporation, has been announced by Robert Gair Company, Inc., New York.

▼

## NEW WAREHOUSE IS UNDER CONSTRUCTION AT NEENAH PLANT OF KIMBERLY-CLARK

A new, six-story warehouse is well under way at Kimberly-Clark Corporation's Lakeview mill in Neenah, Wisconsin. The work is scheduled for completion late this year. Built by F. H. McGraw and Company, the structure is of latest design; it is built of reinforced concrete, with 262,500 sq ft of floor area. The building will be used to store creped wadding.

There are no windows in this new warehouse—air circulation will be provided artificially and certain sections will be air conditioned. The building was designed by Kimberly-Clark's engineering staff. It is 220 ft long by 147 ft wide.

An enclosed train shed which runs the length of the building will facilitate all-weather loading and unloading of materials.

▼

▶▶▶ NEW OFFICES and warehouse of the Sensenbrenner Paper Company, Milwaukee, Wisconsin, are located at 126 North Jefferson Street.


**Use Anthrafilt***

***To Solve Your Filter Problems***

**1.** Increase your filter plant output without increasing the size of your present plant.

**2.** ANTHRAFILT, the hard coal filter medium will increase rates and lengths of filter runs.

**3.** Weighing only about one half as much per cubic foot as other types of filter media ANTHRAFILT backwashes at lower rates.

**4.** Being essentially a carbon you can filter sanitary supplies, hot or cold process water or acid and alkaline solutions.

Many paper mills in all sections of the country now use ANTHRAFILT exclusively. Why not write us today for full details, test samples, recommendations and quotations?

**PALMER FILTER EQUIPMENT COMPANY**

822 East 8th St., P. O. Box 1655
Erie, Pennsylvania

*Representing*

**ANTHRACITE EQUIPMENT CORPORATION**

Anthracite Institute Bldg.
Wilkes-Barre, Pennsylvania

*Trade Mark Reg. U. S. Patent Off.


Corner of warehouse under construction at Kimberly-Clark's Lakeview mill in Neenah, Wis. Building is on shore of Neenah's Little Lake Butte de Mort

▶▶▶ OPERATIONS at the Oswego, New York, plant of the Diamond Match Company, which has been idle for more than two months, were resumed September 6. Inventories of finished matches were excessively high when the factory, employing about 300 people, was shut down June 27. Sales now have reduced these inventories to a point where normal production is indicated.

▼

▶▶▶ A DELEGATION from Portland, Oregon, Chamber of Commerce, toured the plant of Crown-Willamette Paper Company in Camas, Washington, on September 22. George Charters, assistant resident manager, told the visitors that 40 per cent of the pulp manufactured there is made from Douglas fir wood waste.

▼

## POTSDAM PAPER MILLS PLANT BEING DISMANTLED BY OWNER

Following the disposal of all unencumbered assets at a bankruptcy sale, the Potsdam Paper Mills plant at Potsdam, New York, is now being dismantled by the Reading Corrugated Container Company, the present owner. (Cf. P.I. and P.W., June, 1949, page 324.) Following the sale, the Potsdam Paper Mills, Inc., gave up the mill and the Reading Company took posession of the structure and remaining machinery.

All machinery will be trucked to Reading, Pennsylvania. The owner terms the plant a "marginal mill" and at this time feels it would not be profitable to operate it. No decision has been made as to disposal of the building.

## K-C ESTABLISHES NEW SCHOLARSHIP AT NOTRE DAME—RENEWS OTHERS

A graduate fellowship in economics for the school year 1949-50 has been established at the University of Notre Dame by Kimberly-Clark Corporation. This action broadens the base for the corporation's program instituted in 1946, hitherto held to graduate studies on subjects of interest primarily to the pulp and paper industry.

Kimberly-Clark recently renewed grants for research fellowships at MIT, University of Michigan, University of Wisconsin, and established a new one at Purdue, in the fields of chemical engineering, organic chemistry, physics, and forestry. Specific subjects of study and student beneficiaries are selected by the school concerned.

Contact for the new fellowship in economics will be maintained by W. H. Clifford, vice president in charge of finance. Although K-C maintains such liaison and is generally familiar with the work being accomplished, it has no special claim on results and findings, which are published and made generally available as the school may determine.

▼

▶▶▶ SCHOLARSHIPS for the sons of staff members of Portals, Limited, famous British papermakers, have been established at the University of New Brunswick at Fredericton, New Brunswick. Three winners have been announced and already have entered the university. The Portals have been papermakers since 1719 and have manufactured banknotes for the Bank of England since 1724.

# Pump puts the "heat" on grease

HEAT from the shaft of the boiler feed pump shown above kept a conventional grease in plenty of trouble. The severe conditions caused the grease to oxidize and gum up on the pump's ball bearings. Consequently, the bearings overheated. Grease had to be applied every few hours. The pump had to be shut down frequently so that the bearings could be cleaned.

Officials of this plant put their problem to a Standard Oil Lubrication Engineer. The Engineer recommended Stanolith Grease No. 57, a lithium-soap product with the unique ability to withstand both heat and water.

On the bearings, Stanolith stood up under the high temperatures. It would also resist any water washing should leaks develop. Over-heating troubles were stopped. Downtime was eliminated. Instead of the previous daily greasings, only one application of Stanolith was required each week—an important saving of both lubricant and labor.

Lubrication problems caused by heat, water, or low temperatures in your plant can be solved by this *one* lubricant: Stanolith Grease. Through its remarkable versatility, you can avoid the cost and trouble of stocking and using a variety of special greases. A Standard Oil Lubrication Engineer will help you make these savings.

Write Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.

**PROBLEM SOLVED BY...**

**Stanolith Grease**

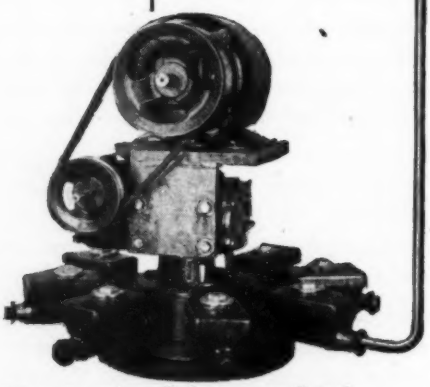
**STANDARD OIL COMPANY (INDIANA)** STANDARD

# LODDING HYDRAULIC OSCILLATING SYSTEM—

**universally applicable—oscillates any doctor on any roll. Space consideration no problem since oscillator occupies no more space than the doctor journal itself. One hydraulic line from each doctor to a master unit which can be located anywhere. One master unit can be used to oscillate as many as eight doctors.**

Actuating cylinder journal of doctor.
Note small space requirement.

The Lodding system offers low initial cost, low installation cost, low maintenance cost. This, plus the fact that it will fit anywhere a doctor will fit, including a great many places where oscillation has long been thought impossible, makes the Lodding Hydraulic Oscillating System the complete answer to the doctor oscillating problem.



Master unit serving all doctors oscillated.
No valves—no circulating system.

Lodding Engineering Corporation, Worcester, Mass.
Represented by W. E. Greene Corporation,
Woolworth Building, New York.

# Pacific Coast Is TAPPI Host

**TAPPI holds fall meeting at the Multnomah Hotel, Portland, Oregon, September 12-15. This is the third national TAPPI meeting to be held on the Pacific coast. Others were at Portland in 1934 and Seattle in 1940. About 800 registrants at the Portland meeting came from all parts of the United States and Canada, and a number of foreign countries.**

▸▸▸ THOSE WHO ATTENDED the TAPPI meeting in Portland found the technical program itself a sufficient reward, but something was added to this meeting—the extra curricular activities such as the Weyerhaeuser sponsored woods trip and the Sun Valley stopover, were events that made this gathering stand out above the usual TAPPI meeting. With nary a hitch nor a sour note, the success of the whole program, from the time the special train left Chicago to the final banquet and party at the end of the convention, is a tribute to the good work and careful planning of the arrangement committees headed by A. G. Natwick and R. J. LeRoux. For more than a hundred who took the special train, the social side of the program started when the train left Chicago on September 8. From all parts of the East and South, TAPPI members converged at Chicago where the special Union Pacific train had been made ready for them.

High spot of the trip west was the stopover at Sun Valley. Most everyone agreed that the ski-lift ride to the top of Baldy Mountain gave them the thrill of a lifetime. With such varied amusements as ice skating, swimming, bowling, tennis, golf, and hiking, the TAPPI visitors did not want for things to do. Climaxing the day's activities was a barbecue party and outdoor dancing.

During the course of the first day, Walt Salmonson and Herb Beck of the Registration Committee spent their time registering the delegates. They, along with H. A. DesMarais, chairman of the Reception Committee, joined the party at Sun Valley in the morning and were responsible in a large measure for the efficient handling of all details. Undoubtedly, the care and planning by the different committees were the reasons the whole TAPPI program was carried off so smoothly.

On Sunday, the scenic ride along the Columbia River was interrupted so the group could visit Bonneville Dam.

High climber, Harold Johnson, demonstrates tree topping

Weyerhaeuser logging camp visited by some 200 Tappimen

A. E. Bachmann
TAPPI president

A. G. Natwick
Co-Chairmen of TAPPI fall meeting

R. J. LeRoux
Co-Chairmen of TAPPI fall meeting

W. F. Holzer
Program Chairman

R. G. Westad, New York, and Hallstein Stolyen, Norway, Borregaard Company

Harold Murdock
back from Japan

Harold Foley
guest speaker

Shibley Award presentation; A. E. Bachmann, W. F. Holzer, Everett Reichman, Vance Reynolds (Shibley Award winner) and James Dykstra

Weyerhaeuser hosts for woods trip—Howard Morgan, Harry Morgan, Clyde Corman

Most interesting part of this side trip was the fish ladder. Many of the visitors had their first closeup view of salmon in action.

Contrary to custom, field trips and mill visits were held the first two days of the convention, preceding the technical sessions. The first day of the meeting, the Weyerhaeuser Timber Company took a group of nearly 250 Tappimen on a tour through one of its tree farms to acquaint the visitors with forest practices and policies that provide a perpetual source of raw material to its mills. Highlight of the tour, arranged by Howard W. Morgan, manager of the Weyerhaeuser Pulp Division, and Harry Morgan, manager of the Lumber Division, was the demonstration of high climbing and tree topping, as well as other modern logging techniques. Most interesting, of course, was the tree topping exhibition in which two Weyerhaeuser loggers showed the skill that recently won for one of them, Harold Johnson, the world championship. Other demonstrations included falling trees with power saws, arch cat skidding and log loading operations.

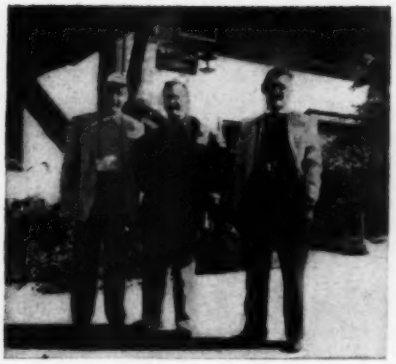
Following a day in the woods, the TAPPI members spent an equally strenuous day visiting pulp and paper mills in the lower Columbia River area. Most of the mills in this area held open house for visitors. Special trips, however, were arranged by the Longview Fibre Company and Weyerhaeuser Timber Company at Longview; Crown Zellerbach Corporation at Camas; Publishers Paper Company at Oregon City; and Crown Zellerbach Corporation at West Linn. Of special interest to many was the new magnesia base sulphite mill at Weyerhaeuser. This mill has been in operation for about a year and a progress report on its operation was given at one of the technical sessions by Ray Baker, manager of pulp operations at this plant.

After two days in the field—some played golf—most of those who made the trek to Portland were ready to settle down for a couple of days participation in the serious technical and business program which characterizes every TAPPI meeting. Technical program chairman was W. F. Holzer, Crown Zellerbach Corporation. Details of the program appeared in THE PAPER INDUSTRY AND PAPER WORLD, August 1949, pages 586-7-8.

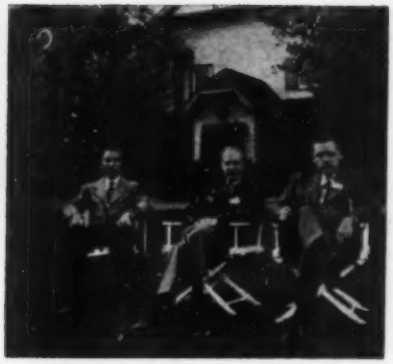
Nearly forty papers were presented at the various technical sessions covering subjects of engineering, fundamental research, wood studies, sulphite pulping, alkaline pulping, and papermaking.

Just as significant, however, were the general sessions and luncheons which

Sun Valley swimming pool attracts TAPPI visitors



Ready for action: A. M. Ream, John Spaulding and Henry Ehrisman

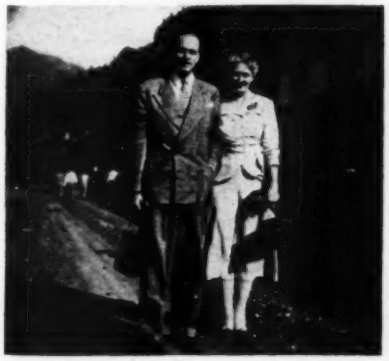


Taking it easy: Martin Downs, J. P. Gearhauser and J. C. Hair

Baldy Mountain lookout; L. V. Forman, Mr. & Mrs. R. A. Huseby, Mrs. & Mr. F. E. Hutton, J. D. Stevens, and R. G. Macdonald

Sun Valley's general store; J. M. Kahn, S. I. Aronovsky, R. O.'Donoghue, Mrs. & Mr. Clyde Faulkender

Mountain climbers: Henry Vranian, W. K. Metcalfe, Ward Pitkin, A. N. Meyers and S. W. Fletcher



Mr. & Mrs. Martin Schnaufer

Dr. & Mrs. Harold S. Hill, Kenogami

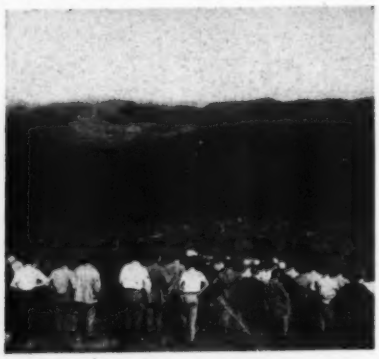
Mrs. & Mr. Gordon Morseth

Logging: P. H. Lathrop adjusts camera

H. R. Heuer and Fred Goodwill

Harold Bialkowsky and D. G. Moon

Paul West takes movies of . . . .



Logging operations

R. Goodwillie, J. Harrison, J. Goodwillie

A. E. Bachmann, W. Holzer, S. J. Robinson

E. O. Ericsson, W. C. Marshall, F. Armbruster

W. D. Stitt, Mace Harris, R. P. Hella

Watching log loading operations: J. W. Hemphill, C. W. Converse, W. W. King, and Ward Pitkin

Mill visit; T. R. Zegree, Harold Wall, D. L. Shinn, Neil Robertson, J. M. Shedd, H. Vranian and J. L. Hayes

featured such speakers as Lawson Turcotte, president of Puget Sound Pulp & Timber Company; Harold S. Foley, president of the Powell River Paper Company, Ltd.; Alexander R. Heron, vice president of Crown Zellerbach Corporation; Harold R. Murdock, formerly chief, Pulp and Paper Branch, National Resources Section, GHQ, Tokyo, Japan; and E. W. Tinker, secretary of APPA.

At the opening session, Mr. Turcotte spoke on the status of the Pacific coast pulp and paper industry. He outlined many of the technical developments made by the industry in recent years and was optimistic in his appraisal of the future.

According to Mr. Foley, one way to meet the challenge to our free enterprise system is to improve manufacturing operations. He went on to say that it is unprofitable to produce and sell low quality products. Free enterprise, he said, thrives on profit and without low costs, profit suffers. Without profit, free enterprise would soon disappear.

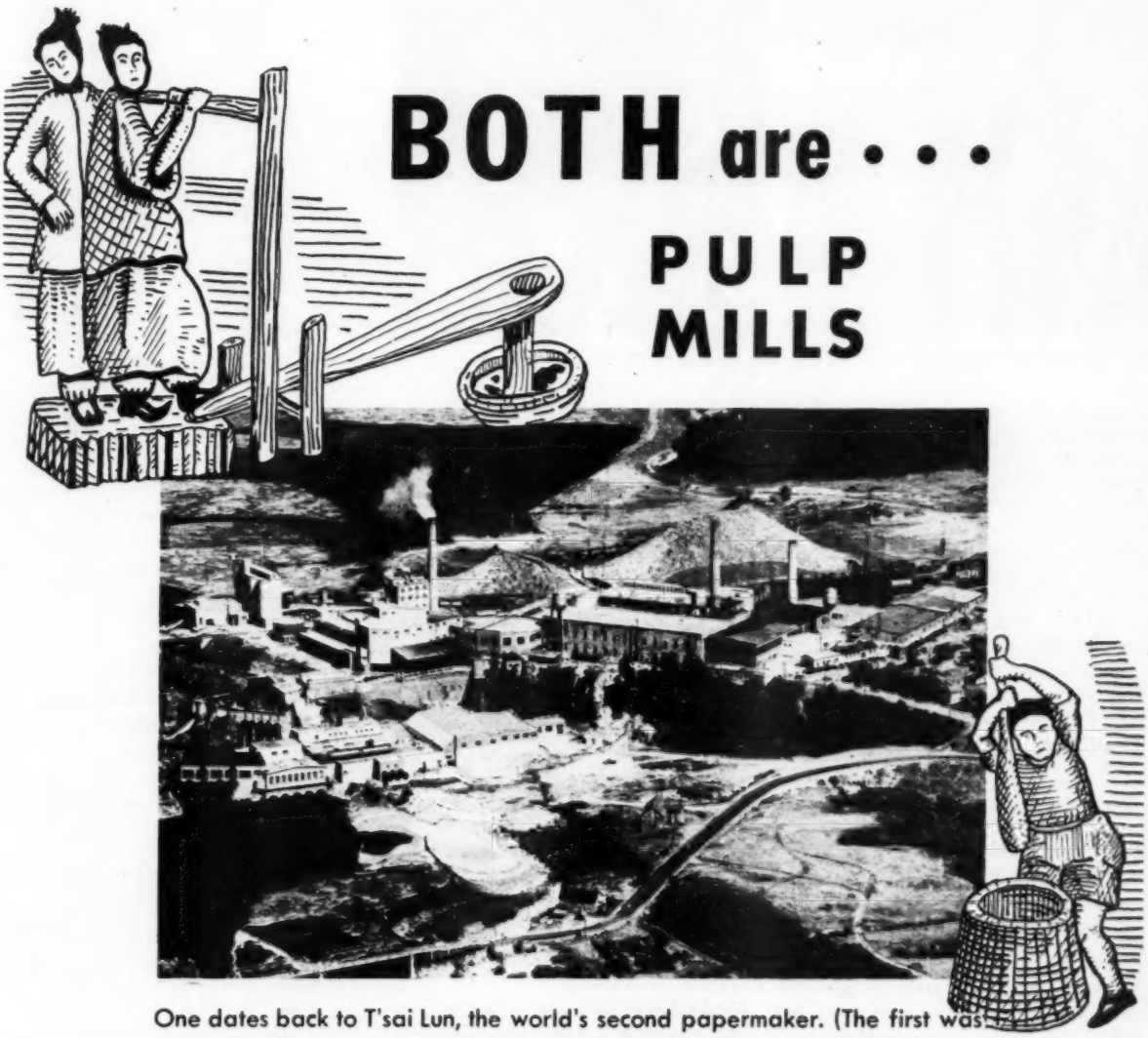
Another speaker to strike out for free enterprise was Alexander Heron who spoke at Thursday's luncheon. He pointed out that management has a responsibility to provide jobs for those who wish to work. If management doesn't accept this responsibility, he asserted, government is ready and willing to take over.

Harold R. Murdock described the problems facing the Japanese paper industry. Called to Japan in 1946 to assist MacArthur in the recovery of the pulp and paper industry, he recalled that little research was done but that the Japanese kept up with competition because of their ability to copy foreign methods and processes. He indicated that the iron grip Oji Paper Manufacturing Company had on the industry (Cf. International Review, this issue) caused a great deal of backwardness and since it was broken up, together with other reforms, paper production of 1949 has been upped to twice that of the 1945 output.

One of the outstanding events at the opening session was the presentation of the Shibley Award. This award is a memorial to the late Kenneth Shibley, prominent northwest chemical engineer, and is offered yearly by the Pacific Section of TAPPI for the best research paper prepared by the younger technical men in the pulp and paper industry of that area. This year's winner of the $50 prize was Vance L. Reynolds of Puget Sound Pulp & Timber Company, Bellingham, Washington, whose paper, "Separation of Dirt From Unbleached Pulp by Centrifugal-Type Classifiers," was given at

# BOTH are . . .

## PULP MILLS



One dates back to T'sai Lun, the world's second papermaker. (The first was *Vespa maculata,* the hornet, or papermaking wasp.) The other is KVP's model new mill at Espanola, Ontario - the last word in sulphate pulp mill construction.

**KVP often called *The World's Model Paper Mill,* is the parent organization of the following plants, specializing in**

**FOOD PROTECTION and HOUSEHOLD PAPERS**

**Kalamazoo Vegetable Parchment Co.**
Devon, Pennsylvania

**Harvey Paper Products Co.**
Sturgis, Michigan

**KVP Company of Texas**
Houston, Texas

**Appleford Paper Products Limited**
Hamilton, Ontario · Montreal, Quebec

**KVP Company Limited**
Espanola, Ontario

KVP

KALAMAZOO VEGETABLE PARCHMENT COMPANY
PARCHMENT · MICHIGAN

R. G. Misplay and E. C. Sherman

L. E. Herman, and Geo. J. Ritter

C. T. Beals and G. W. Hough

a later session. Other contestants were Everett Reichman, Simpson Logging Company, Shelton, Washington; James Dykstra, Publishers Paper Company, Oregon City, Oregon; and Robert S. Towne, Fibreboard Products, Inc., Port Angelus, Washington. W. R. Barber discussed the background and purpose of the Shibley Award and the presentation was made by A. E. Bachman, president of TAPPI.

International interest in the TAPPI meeting was apparent from the presence of pulp and paper men from a number of foreign countries such as Japan; Mexico; Tasmania, Australia; and Scandinavian countries. Among these visitors were A. Ray Sloman, research manager, and J. Cornelius, production superintendent of Associated Pulp & Paper Mills, Ltd., Tasmania. This mill, some 200 miles south of Melbourne, makes paper from Eucalyptus trees. (Cf. THE PAPER INDUSTRY AND PAPER WORLD, June 1949, pages 343-345.) Prior to arriving in this country a few months ago, the two Tasmanians spent some time visiting mills in Finland and Sweden. They have been visiting mills in United States and Canada for the past several months.

Another foreign visitor was Hallstein Stolyen, mill manager for the Borregaard Company, Sarpsborg, Norway. Accompanied by his San Francisco born wife, he is on a three-month tour of pulp and paper mills in this country. Mr. Stolyen is investigating American equipment and methods which might be incorporated in Norwegian mills now being rebuilt.

Just as important, but not quite so strenuous as the men's activities, was the program arranged for some 200 ladies who registered with their husbands at the conference. Starting with a tea that honored wives of the National TAPPI officers, the program included a golf tournament, card party with prizes, and a trip to Timberline Lodge on Mt. Hood. Highspot of the ladies' program was a fashion show put on by Charles F. Berg Company in Portland.

Final event of the conference was the banquet, floor show and informal dance held at the Multnomah Hotel.

Responsible for the arrangements that made this meeting so successful were the chairmen of various TAPPI committees, as follows:

*General Co-Chairmen*—A. G. Natwick, Crown Zellerbach Corp., R. J. LeRoux, Weyerhaeuser Timber Co.
*Technical Program*—W. F. Holzer, Crown Zellerbach Corp.
*Publicity*—Z. A. Wise, Griffith Rubber Co.
*Travel*—R. W. Wertheimer, Longview Fibre Co.
*Woods Trip*—H. W. Morgan, Weyerhaeuser Timber Co.
*Entertainment*—Ray Smythe, Rice Barton Corp.
*Registration, Housing, Food*—M. J. MaGuire, Hercules Powder Co., B. E. Natwick, Appleton Wire Works, Inc.
*Finance*—R. M. True, General Dyestuffs Corp.
*Mill Visits*—Gus Ostenson, Crown Zellerbach Corp.
*Reception*—H. A. DesMarais, General Dyestuffs Corp.
*Local Transportation*—J. M. Fulton, Pacific Coast Supply Co.

▼

## FIRST MEETING OF SEASON FOR MICH. SUPERINTENDENTS

Opening the 1949-50 season, approximately 60 members and guests attended the first monthly dinner meeting of the Michigan Division of The American Pulp and Paper Mill Superintendents Association, held September 15 at Hotel Harris, Kalamazoo, Michigan. William F. Hathaway, Kalamazoo Vegetable Parchment Company, and chairman of the Division, presided.

The speaker of the evening was James S. Thornton, of Downingtown Manufacturing Company, Downingtown, Pennsylvania, whose subject was Fourdrinier Auxiliaries. Following the address, there was a question and answer period with open discussion. Mr. Thornton made use of lantern slides to illustrate his talk.

During the evening, Herbert Johnston, Allied Paper Mills, was presented with a framed certificate as a token of appreciation of the Division for the job he did last year as its chairman. The presentation was made by Glen Sutton, Sutherland Paper Company, third vice president of the national organization.

Present at the meeting were Charles Reese, national Association president, and Harry E. Weston, associate secretary-treasurer of the parent Association. Both spoke informally, commenting on activities and aims of the Association.

▼

## OFFICERS FOR 1949-50 ELECTED BY MIAMI DIV. SUPERINTENDENTS ASS'N

At the annual fall meeting of the Miami Valley Division of The American Pulp and Paper Mill Superintendents Association new officers for 1949-50 were elected as follows:

*Chairman*—Kon Matchuk, Maxwell Paper Co., Franklin, Ohio.

*1st Vice Chairman*—John Burdsall, Crystal Tissue Co., Middletown, Ohio.

*2nd Vice Chairman*—Edward Bindley, Cheney Pulp & Paper Co., Franklin, Ohio.

*Secretary-Treasurer*—Charles Moore, Maxwell Paper Co., Franklin, Ohio.

An important feature of the meeting was the presentation of an Association life membership to Robert Engelhardt. The presentation was made by Harold C. Leighton, Beckett Paper Co., outgoing chairman of the Division.

Highlighting the meeting was a short address by the Association's national president, Charles Reese, who spoke on some of the immediate plans and aims in the Association program.

About 142 members and guests attended the meeting which was held September 16 at Hamilton, Ohio.

▼

▶▶▶ A FILM TITLED, "Modern Pulp Wood Mechanization," will be shown by Walter Glass of F. C. Huyck & Sons as an extra feature of the Southern Division convention of the Superintendents Association to be held in Monroe, Louisiana, October 24-26. The film features the woods operations of the International Paper Company at

YOU CAN BE **SURE**.. IF IT'S

# Westinghouse

# Top Performance

## for Slow-speed Drives

You get maximum performance from slow-speed drives when you use Westinghouse Speed Reducers. High operating efficiency and long service life are assured by important *plus* features inherent in Westinghouse design and construction. In addition, you are able to take advantage of Westinghouse undivided responsibility . . . a single source of responsibility for speed reducers, *and* motors, couplings and bedplates. Westinghouse extra values include:

- Taper-hardened BPT Gear Steel Gears, single-helical design . . . for maximum load-carrying capacity, quiet operation.
- Simple, positive lubrication—2-compartment oil reservoir.
- Rugged case of split construction, for easy accessibility.
- Tapered roller bearings—minimum friction loss.
- Nationwide service organization—competent help where and when you need it.

Call your nearby Westinghouse representative for further data, or write for Bulletin DB-3700-SR, Westinghouse Electric Corporation, Dept. 710, P.O. Box 868, Pittsburgh 30, Pennsylvania. J-07283

TAPER-HARDENED

Taper-hardened Tooth Section

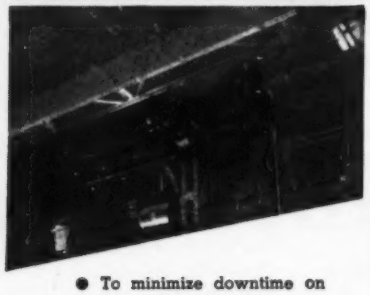
Case-hardened Tooth Section

Note how the exclusive Westinghouse "Taper-hardening" process gives BPT Gear Steel Gears high surface hardness . . . necessary for long wear . . . *PLUS* graduated hardness toward the root of the tooth . . . necessary for toughness.

Westinghouse

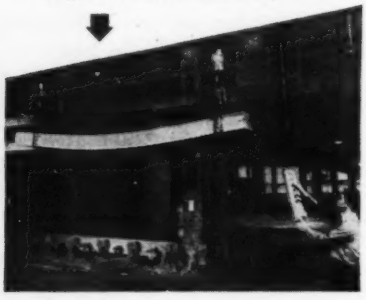
GEARED DRIVES

Modern Handling System
Reduces
MACHINE DOWNTIME



● To minimize downtime on a milling machine, finished flat stock had to be lifted out of the way quickly and easily. The customer, a prominent steel company, called in a Reading Engineer. A custom-built Hoist and Crane, with an extra long lift and push button control of *all* motions, was engineered and installed. Now handling of finished stock is no longer a "time-waster."

This method of engineering special handling systems, *at no extra engineering cost*, is standard practice with Reading. For full details on how you can use it to reduce handling costs and modernize operations, call in a Reading Engineer. There is no obligation.



READING CHAIN & BLOCK CORPORATION
2113 ADAMS ST., READING, PA.
Chain Hoists • Electric Hoists
Overhead Traveling Cranes

READING HOISTS

Georgetown, South Carolina. It shows barges being loaded at the Wilmington, North Carolina, dock with Gantry cranes, and details of equipment used to load and unload trucks and pick up loose wood in the yard. Land management and fire demonstrations are also featured. The film is in color, and is 2,000 ft in length.

▼

## AWARDS ANNOUNCED IN GIMMICK CONTEST HELD BY SUPERINTENDENTS ASS'N

Winners in the Gimmick Contest of The American Pulp and Paper Mill Superintendents Association, Inc., which contest ended with the Association's convention in Atlantic City this year, have been announced by Raymond F. Bennett, chairman of the judges committee.

The following awards were made:

First prize went to Franklin J. Reilly, 831 North LaSalle St., Chicago, for his entry describing a vacuum slice for a cylinder board machine.

Second prize was awarded to Carl L. Hackbarth, Hacienda Paramongo, Supe, Peru, for his entry describing a wire or felt warning signal.

No third prize was awarded since, in the opinion of the judges, the other material submitted for consideration did not warrant such action.

In addition to Mr. Bennett, the committee of judges was composed of Wm. H. Brydges, Lynchburg, Virginia; and Raymond L. Barton, Michigan Paper Company, of Plainwell, Michigan.

▼

## LARGE ATTENDANCE MARKS OPENING OF FALL SEASON FOR N.Y.-CAN. SUPTS.

Approximately 350 persons attended the formal opening of the annual fall meeting of the New York-Canadian Division of the American Pulp and Paper Superintendents Association at the Hotel Champlain, Bluff Point, New York, on September 9. Representatives numbered about 150, many of them with plants all over the world. The New York-Canadian Division includes New York State, the Province of Ontario, and a portion of the Province of Quebec.

Donald R. Dick, production manager of the Howard Smith Paper Mills, Ltd., Cornwall, Ontario, was elected chairman of the division for the coming year.

National officers attending the meeting included President Charles Reese, whose home is in Port Edward, Wisconsin; Trustee William Brydges of Pig Island, Virginia; and National Secretary George Craigie of New York City. Furthest-traveled superintendent attending the conference was Robert Engelhardt, who was accompanied by his wife from their home in Guatemala. Engelhardt was formerly chairman of the New York-Canadian Division. He said that the meeting gave him an opportunity to "renew old acquaintances."

Between sessions of the conference, visits were made to the Diamond Match Company and Imperial Paper and Color Corporation plants at Plattsburgh, New York, and to the J. & J. Rogers Company at Au Sable Forks, New York, and the New York & Pennsylvania Company, Inc., at Willsboro, New York.

▼

▶▶▶ A NEW POLICY of "open door meetings" has been adopted by the Association of Consulting Chemists and Chemical Engineers, Inc. Representatives of industry and nonmember professional men will be welcome at the 22nd annual dinner meeting, October 25, 1949, 5:00 P.M., at the Shelburne Hotel, New York City. The guest speaker will be Robert A. Whitney, president of the National Federation of Sales Executives, New York, on "Better Selling—The Catalyst of Our Economy." Check for $6.50 to the order of the Association must be remitted with reservation and full name and address, including company affiliation.

▼

## COMING EVENTS

Oct. 24-26—Southern Div. Superintendents Association, Fall Meeting, Frances Hotel, Monroe, La.

Oct. 24-28—Annual Safety Congress and Exposition, National Safety Congress, Chicago.

Oct. 31-Nov. 3—TAPPI, Engineering Conference, Statler Hotel, Boston, Mass.

Nov. 1-5—Pacific Chemical Exposition, California Section, American Chemical Society, Civic Auditorium, San Francisco, California.

Nov. 28-Dec. 3—22nd Exposition of Chemical Industries, Grand Central Palace, New York City.

1950

Jan. 16-19—First Plant Maintenance Show, Auditorium, Cleveland, O.

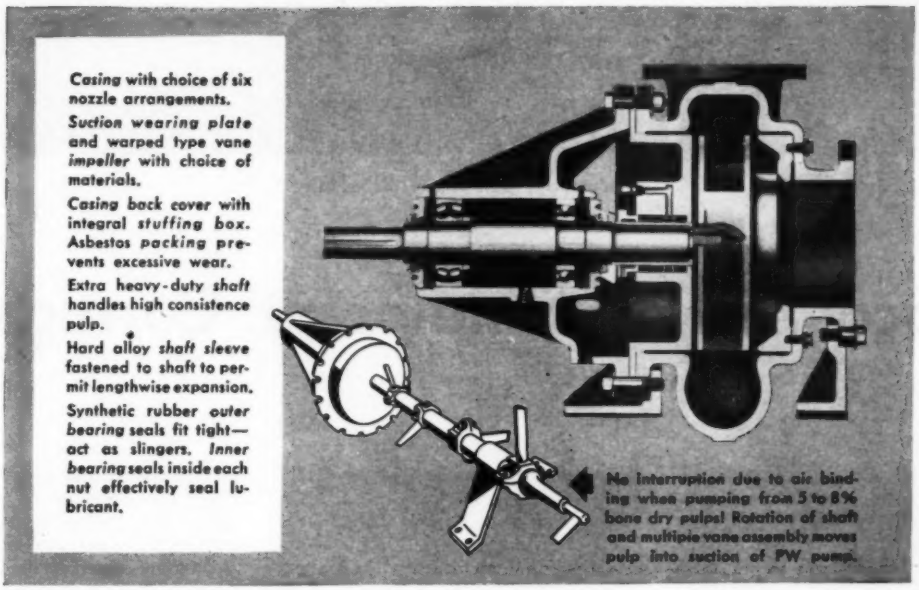
Feb. 19-24—Paper Week. Annual meeting of the American Paper and Pulp Association and paper groups, at the Waldorf-Astoria Hotel, New York City.

### STATED MEETINGS

Chicago section of TAPPI meets the third Monday of each month at the Chicago Bar Association, Chicago, Ill. First meeting of the season will be held on Sept. 19.

A group of TAPPI members and friends in Cleveland will sponsor a series of dinner meetings to be held on the first Friday of each month during the coming winter. The name tentatively chosen for this group is Lake Erie Papermakers and Converters Association. First meeting on Oct. 7 will be held at Hickory Grill, 929 Chester Ave., Cleveland, Ohio.

# "PW" Pump Delivers 8% Bone Dry Pulp!


Casing with choice of six nozzle arrangements.
Suction wearing plate and warped type vane impeller with choice of materials.
Casing back cover with integral stuffing box. Asbestos packing prevents excessive wear.
Extra heavy-duty shaft handles high consistence pulp.
Hard alloy shaft sleeve fastened to shaft to permit lengthwise expansion.
Synthetic rubber outer bearing seals fit tight—act as slingers. Inner bearing seals inside each nut effectively seal lubricant.
No interruption due to air binding when pumping from 5 to 8% bone dry pulps! Rotation of shaft and multiple vane assembly moves pulp into suction of PW pump.

## • TEAMED WITH HI-DENSITY FEEDER FOR HEAVY-DUTY STOCK PUMPING

● Iron, Ni-Resist and Stainless Steel parts carried in stock for quick shipment.

● Heavy-duty construction — Oversize shaft.

● Variable discharge nozzle arrangements.

THE "PW"—"HI-DENSITY FEEDER" TEAM was developed specifically for heavy-duty requirements of stock pumping. Simple design — only four *easily removed* working parts in contact with stock pumped.

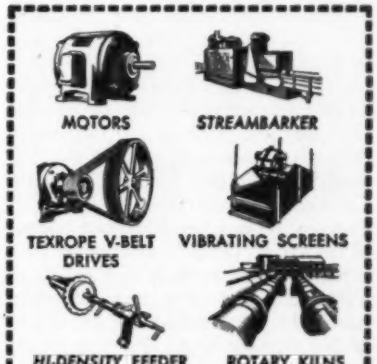
**Features of PW Pump**

▸ Entire rotating element removable without disturbing suction or discharge piping. ▸ Parts inventories can be cut as much as 70% because comparable size units of different ratings have interchangeable parts.

▸ Eight sizes with capacities from 175 to 8000 gpm — heads to 140 ft. ▸ Suitable for direct drive. Merely loosen four base bolts and the motor slides back along the base on steel plates. This insures proper alignment after pump is dismantled or reassembled.

For more details about the PW pump or Hi-Density Feeder, contact your nearby Allis-Chalmers Sales Office or write for Bulletins 08B7112 and 08B6725A. A-2739

ALLIS-CHALMERS, 991A SO. 70 ST. MILWAUKEE, WIS.




AND OTHER EQUIPMENT FOR PAPER MAKING . . .

*Hi-Density, Texrope* and *Streambarker* are Allis-Chalmers trademarks.

A-C ALLIS-CHALMERS

# ALLIS-CHALMERS

Fiftieth anniversary for Sonoco . . . a family enterprise develops into an integrated industry

# Sonoco Makes Nine-point Corrugating

▶▶▶ A UNIQUE ENTERPRISE is the Sonoco Products Company of Hartsville, South Carolina. Founded after the Civil War by the grandfather of the present heads of the business, it has been earnestly and consistently fathered by each new generation. In contrast to many American businesses controlled by single families, it has shown a steady and natural growth.

Now, as Sonoco celebrates its fiftieth anniversary, its progress is accelerated by the successful operation of the new No. 8 fourdrinier board machine and its rebuilt neutral sulphite semichemical pulp mill at Hartsville. The story behind this new mill is a little out of the ordinary in that the Ohio Boxboard Company and the Hankins Container Corporation each furnished one-quarter of the capital needed to build the mill, as assurance of a continuous supply of container board. The two companies have a 15-year contract for the output of No. 8 machine.

## Fifty Years a'Building

Sonoco, recognized today as one of the world's largest producers of textile specialties made from paper, had its beginning in 1890 when Major James L. Coker organized the Carolina Fibre Company to produce paper from southern shortleaf pine. Using this paper, he started manufacturing paper cones and paper tubes at the Southern Novelty Company which he founded in 1899. These products were new to the textile industry at that time since mills previously had used wooden spools on which to wind yarns and threads.

One son of the founder, James L. Coker, Jr., who later became Carolina Fibre Company's president, is credited with doing much of the pioneering work on the pulping of southern pine by means of the sulphite process. To a younger son, Charles W. Coker, fell the task of widening the demands for these textile paper specialties by initiating and building up the sales organization of the Southern Novelty Company. In 1924, the name was officially changed to Sonoco Products Company and in 1941 the Carolina Fibre Company was merged with Sonoco.

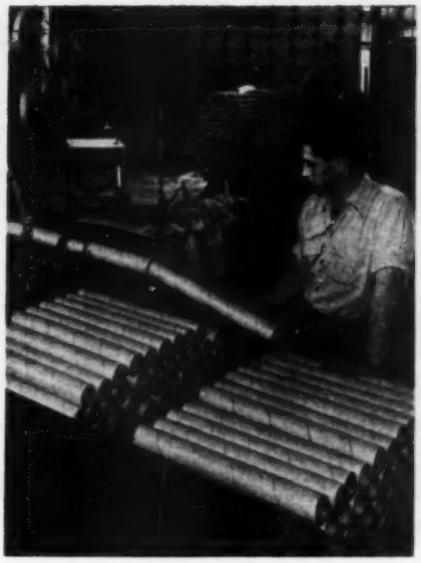
When Charles W. Coker died in 1931, after managing the company for twenty-odd years, he left a smooth running organization of young men headed by his son, James L. Coker III, as president, and another son, Charles W. Coker, Jr., as vice president. At the time of the merger in 1941, Richard G. Coker, who had been president of the Carolina Fibre Company, became secretary and chief engineer of Sonoco. These men continue in their positions and other current officers include C. H. Campbell, vice president in charge of sales; C. K. Dunlap, vice president in charge of engineering; J. B. Gilbert, treasurer, and G. W. B. White, vice president in charge of northern operations. These men, along with John H. Martin, Robert R. Coker, J. Harold Lineberger, Edgar H. Lawton, P. L. McCall, and A. H. Gildersleeve make up the board of directors.

Besides being endowed with sound business instinct and above average inventiveness, the Cokers have been able, from the beginning, to enlist in their enterprise many men whose technical skills and business talents have helped Sonoco to become a leader in its field. Shortly after the company was organized, W. F. Smith was brought into the company for his technical ability in the manufacture of textile paper carriers. Another, whose contribution has been outstanding, is C. K. Dunlap, who has originated designs for much of Sonoco's machinery. This has been no small task since Sonoco not only designs but builds all of its highly specialized machinery in its own shops.

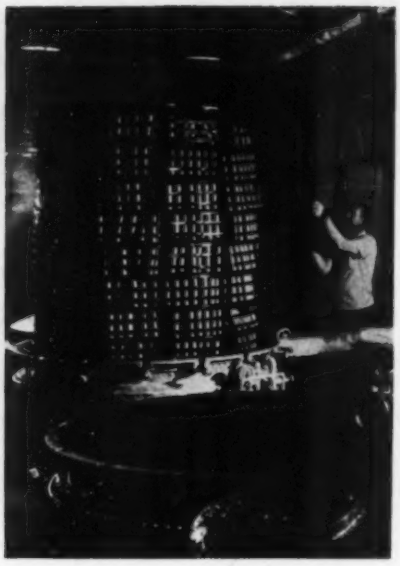
Undoubtedly a significant factor in the progress of the company has been an adherence by the descendants to the business and social principles of the founder. Not only did Major Coker believe in research and experimentation to improve his products and widen his markets, but he also believed in im-

1 Chemical Laboratory
2 Experimental Shop
3 Shipping Platform
4 Cone Department Building
5 Personnel and Production
6 Used Machinery Storage
7 Treated Tube Building
8 Engineering and Development
9 Tube Building
10 Paper Mill #1
11 Main Office
12 Pulp Mill
13 Wood Yard
14 Paper Mill #2
15 Spiral Tube Department
16 Supply Room and Storage
17 Power Department
18 Wood Mill

Airview legend



Making spiral tubes



Lowering tubes into resin kettle

# Board from Semichemical Pulp

James L. Coker III, Sonoco's president

Charles W. Coker, Jr., vice president

Richard G. Coker, secretary and ch. engr.

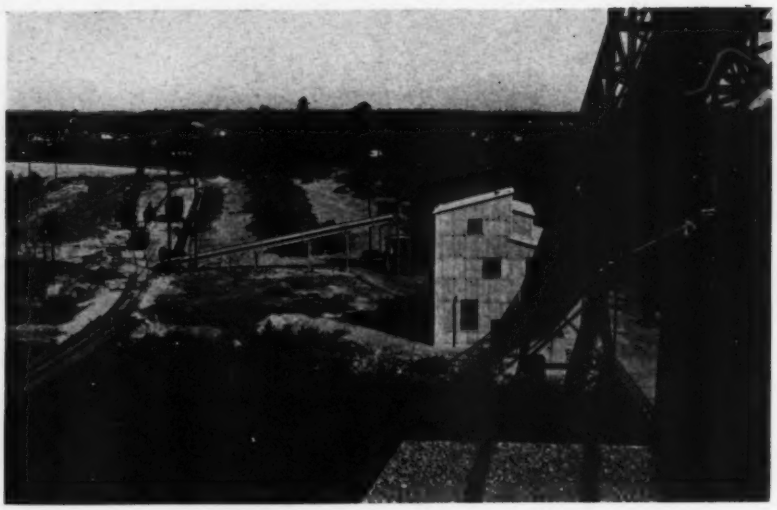
proving his own community. In the latter field, he was instrumental in founding a high school for boys and a college for girls.

Today, his grandsons, James L. Coker, Charles W. Coker and Richard G. Coker, have carried on his beliefs in such a manner that Sonoco has become outstanding in the employee-employer relations field. As a result of employee participation in management through an advisory board and a system of grievance settled by the employees themselves, labor unrest is almost unheard of in this company. This is a notable achievement for a concern which started with twelve employees in a tiny shop but which now maintains plants in five states, Canada, and England, with more than 3,000 workers.

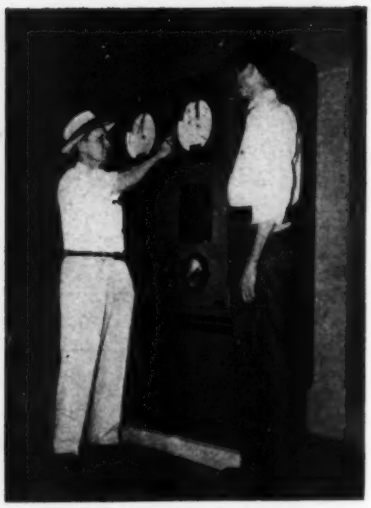
## The Business Expands

As its business expanded, the Southern Novelty Company installed its own paper machines for making raw materials for its growing line of products. Carolina Fibre turned to the production of sulphite butchers paper until 1926 when the pulp mill was converted to a semichemical process. One of the pioneer semichemical mills using the neutral sulphite process, this company continued to produce butchers paper until shortly before the war when the pulp mill was shut down.

When the two separate companies merged in 1941, Sonoco operated three paper machines and her sister company had one. Increased demand led to the building of three machines between 1941 and 1947. These were built by Sonoco's own engineers, mostly from



Wood yard and chipping mill, chip conveyor to pulp mill



P. L. McCall and W. A. Morgan

Grapple drops wood in flume

Barking drum

Semichemical pulp mill—filtrate tanks and foam tower at right

secondhand parts, for the simple reason that delivery on new machines was too slow.

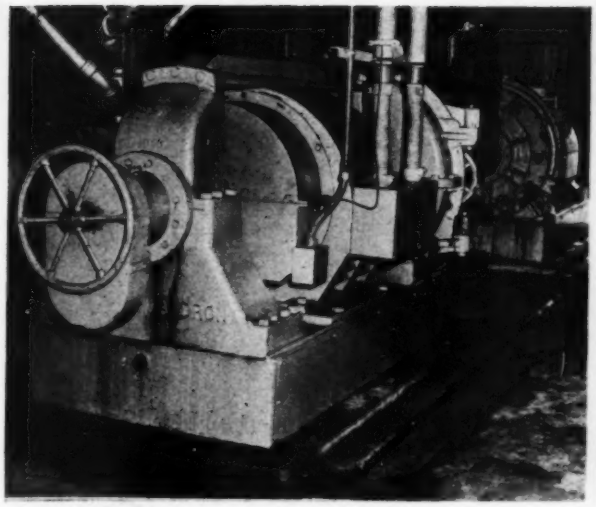
Launched in 1947, the latest expansion program included a new spiral tube manufacturing building, a new engineering building, in addition to the new woodyard, semichemical pulp mill and No. 8 machine. A new power boiler is still under construction.

Modernizing the pulp mill required the installation of a new digester, refiners, and brown stock washing system. Existing liquor-making equipment was adequate except for addition of new soda ash storage and dissolving equipment, and a new sulphur burner.

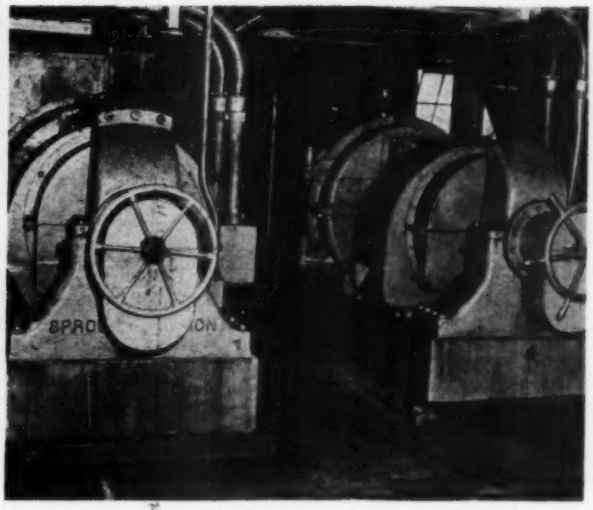
No mill, however, can be better than the men responsible for its design, construction, and operation. Among those whose know-how and skill contributed greatly to the success of this expansion program are P. L. McCall, superintendent of the No. 8 Project; Charles N. Rogers, engineering department; W. A. Morgan, assistant fourdrinier superintendent; Stanley Boyd, pulp mill superintendent, and Ellie Heustis, woodyard superintendent. Consulting engineer for the project was Roderick O'Donoghue, of New York, and Fiske-Carter Construction Company, Spartanburg, South Carolina, handled general construction. Subcontracts were handled by Industrial Piping, Inc., Charlotte, North Carolina; Huntington & Guerry, electrical contractors, Greenville, South Carolina; Reid-Hayden, insulating contractors, Charlotte, North Carolina.

## Flume Conveyor

Gumwood in 5-ft. sticks is received at the woodyard via both railroad and motor truck. It is unloaded either man-



Primary refiners disintegrate cooked chips



Secondary refiners follow brown stock washers

ually or by a crawler crane with a 60-ft. boom and an orange peel grapple hook. Arrangement of the woodyard centers around the 500-ft. flume conveyor, one of the first such units to be successfully used in the south. Railroad tracks run on both sides of the flume and these are flanked by the block storage piles holding about 6,000 cords.

In contrast to most such systems employed by pulp and paper mills, the Sonoco flume operates by a single pass gravity flow of water rather than recycling the conveyor water by pumping. Black Creek flows through the company property and is impounded by a dam forming Prestwood Lake. This provides ample water at sufficient head for operating the flume conveyor. The flume is 5 ft. deep, 7 ft. wide at the top, and is designed with sloping sides to facilitate loading and to minimize plugging. When a jam starts the water rises and tends to float the logs loose. Gates at the upper and lower end of the flume control the discharge of water and at the same time the depth of water in the flume. This conveying system is capable of handling some 60 cords of wood per hour.

Wood is removed from the flume by a "haul-up" conveyor or jack ladder which discharges to a chain conveyor that feeds the 12 x 30 ft Murray drum barker. Bark drops through the open slots in the drum into a drag conveyor that discharges into an incinerator where it is burned without heat recovery. The homemade incinerator was constructed of two old beater tubs and two discarded liquor tanks.

Clean wood from the barker is transferred by chain conveyor to the wood room. Wood that is not cleanly barked passes to a sorting table and reject conveyor back to the barking drum. Chips from the 88-inch diameter 4-knife Carthage chipper drop to a conveyor belt which discharges to a bucket elevator. From here the chips go down a chute to the double deck chip screen.

The top deck of the Robins Vibrex screen has 2½-inch square openings and passes about 97 per cent of the feed while the sawdust goes with chips. Oversize chips are reduced in a 36-inch Waterville Iron Works hammermill by belt and drag conveyors to four chip screens. Accepted chips are transferred by belt and drag conveyors to four chips bins over each of the four digesters. Chip conveyors and elevators were supplied by Webster Manufacturing Company.

## Neutral Sulphite Liquor

Gumwood chips are cooked with a neutral sodium sulphite liquor to produce a high yield semichemical pulp. Raw materials for the cooking liquor are sulphur and soda ash. Chemical usage per ton of bone dry pulp is about 90 lb of sulphur and 300 lb of soda ash.

Both soda ash and sulphur are received by railroad. Soda ash, when unloaded from the hopper bottom cars, is transferred by screw conveyor and bucket elevator to the Neff and Fry storage silo. About 25 ft in diameter and 50 ft high, this dampproofed concrete stave silo has a capacity of about 450 tons of soda ash.

Soda ash is removed from the bottom of the silo by a screw conveyor that charges the steel dissolving tank. Soda ash liquor is then pumped to either one of the two sulphite accumulator tanks before being recycled through the absorption towers.

Sulphur is burned in a standard 30-in diameter x 8 ft long Glens Falls rotary burner with a screw feed from a manually filled feed hopper. From the combustion chamber the $SO_2$ gas is cooled before entering the bottom of either of two absorption towers packed with ceramic raschig rings where it is absorbed in the counter current flow of soda ash solution. The soda ash liquor is circulated and recirculated through the tower until enough $SO_2$ is absorbed to bring the liquor up to strength. Basic reactions in the absorber are:

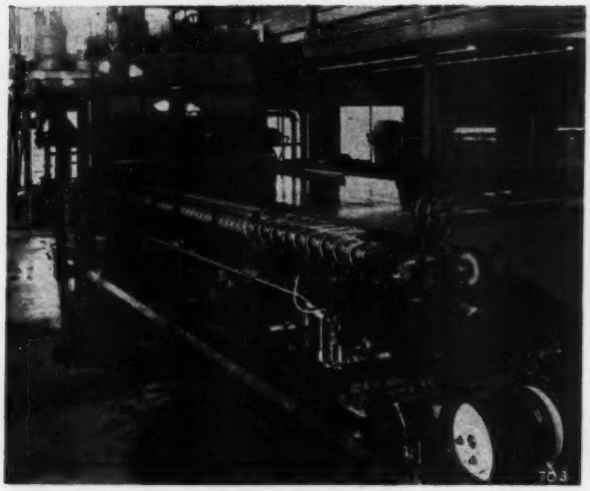
$$Na_2CO_3 + SO_2 \rightarrow Na_2SO_3 + CO_2$$
$$Na_2CO_3 + CO_2 + H_2O \rightarrow 2\ NaHCO_3$$

Strong liquor is pumped to the storage tanks in the digester house. Here it is diluted with water to the desired cooking strength.

## Semichemical Cook

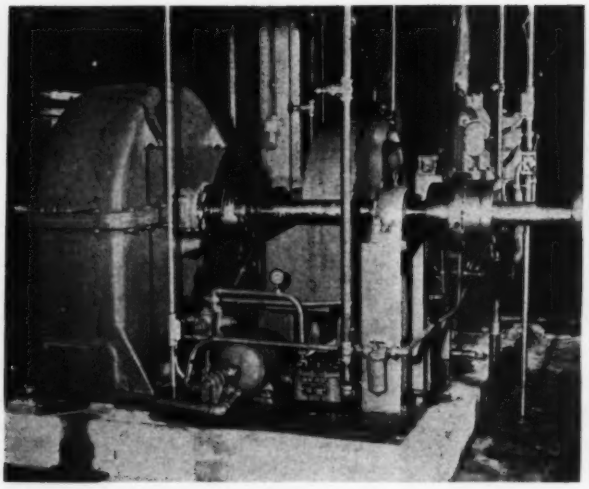
Perhaps the most important aspect of the semichemical process is the high yields obtained. Here gumwood chips are cooked with neutral sodium sulphite on a 5-hour cycle with a pulp yield of 75-80 per cent. Four 15 ft diameter globe rotary digesters are employed (three Biggs and one Combustion Engineering). Each of these holds about 8 cords of wood chips yielding about 8-1/3 tons of pulp (A.D.) per cook.

The empty digester is rotated so that the loading and unloading port is up. Chips fall by gravity from the overhead hopper into the digester and when fully loaded the cover is bolted on. Both trunnions of the digester are hollow to permit entrance of steam and cooking liquor, venting of air and gases, and the discharge of black liquor. Air in the digester is displaced by steam, liquor is added, and steam turned on to hold cooking pressure at

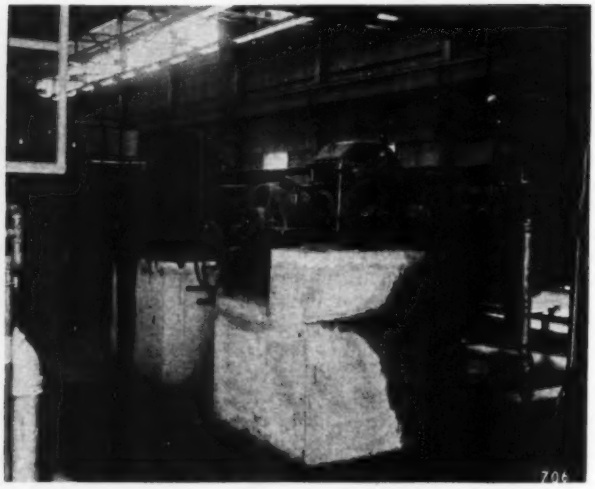


No. 8 machine fourdrinier (Downingtown)

Two suction presses



Steam turbine powers line shaft drive



Double shake unit

100 psi. Rotation of the digesters is not continuous but periodic, and is controlled automatically.

When cooking is completed, steam is shut off and the spent liquor blown to a cyclone separator. Steam is vented out the stack and liquor goes to a storage tank. When pressure in the digester is reduced to atmospheric the cover on the charging port is removed and the digester rotated so that the cooked chips, retaining their original form and containing absorbed liquor, are emptied by gravity into the wooden stave tank directly under each digester.

## Leach Casters

These dump chests are about 15 ft diameter x 11 ft deep and will hold one digester cook. Each unit is equipped with a mechanical arrangement called a "leach caster" for discharging chips at a more or less uniform rate through a bottom opening to a drag conveyor.

The leach caster consists of a horizontal rotating paddle with blades arranged to move chips from the surface to the outer periphery of the tank. As the chips fall through the discharge outlet at the bottom of the tank into the drag conveyor, the leach caster levels the surface to provide constant feed to the conveyor. Operation of the leach caster is tied to the demand of the preliminary refiners.

The leach caster was originally developed by the tannic acid industry for use in discharging spent tan bark from leaching tanks after tannin extract had been leached from the wood.

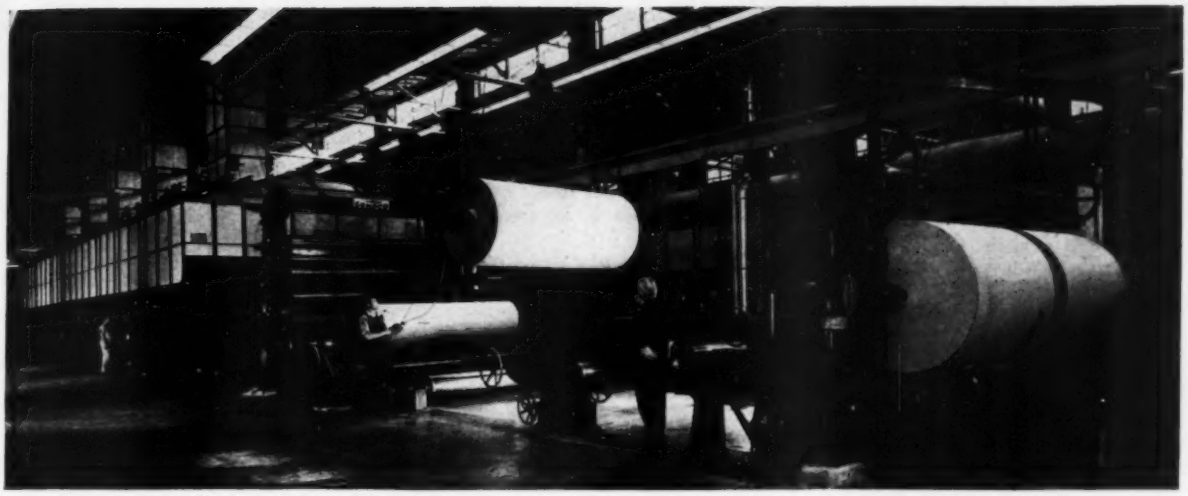
From the leach casters the drag conveyor transfers the cooked chips to a Webster bucket elevator which takes them to the top floor of the building. Here, another drag conveyor receives the discharge of the bucket elevator and distributes to two individual feeder belts, one for each of the refiners. Feed to the refiners is governed by a guillotine slice that diverts the excess chips to a conveyor which returns them to the elevator boot.

## Magnetic Pulleys

Tramp iron is removed by magnetic pulleys on each of the two refiner feed conveyors. This is extremely important in any pulping process where stock is refined prior to screening. Use of magnetic devices for this purpose prevents damage to the refiner disks.

## Mechanical Pulping and Washing

Even though subjected to the tumbling action of the rotary digester, the chips retain their original form. They are softened by the relatively mild cook and must be pulped by mechanical means. It is because the chips are not pulped that they must be transported by conveyor rather than by pumps. Since the chips are relatively dry, black



Bagley & Sewall dryers, calender, reel, and rewinder

liquor is added prior to mechanical attrition and this addition is regulated so that brown stock in the chest has a consistency of about 3 per cent.

Pulping is accomplished in two Sprout Waldron 36-2 disk refiners operating in parallel and discharging directly to the brown stock chest. Each refiner is direct connected to a 400 hp synchronous motor operating at 900 rpm and each can handle about 60 tons per day of semichemical pulp chips.

After pulping, the stock is washed in two 2-stage 8 x 16 ft Oliver brown stock washers. These are arranged for 4-stage counter current washing. Provision is made for the addition of a third washer drum when and if desired. Both vacuum washers are served by a single Nash vacuum pump. Air and filtrate from each washing stage is separated, with the filtrate going to individual filtrate tanks, and the air line hooked up to the vacuum pump manifold. Clarified white water from No. 8 machine save-all is preheated by the hot air and gases in the vacuum manifold condenser, and is pumped from the seal pit and heated further in a Schutte & Koerting heat exchanger before going to the fourth stage showers. Unclarified white water from No. 8 machine is used in the final repulper before the washed pulp from the Oliver unit drops to the washed stock chest to about 5 per cent consistency. Filtrate tanks and foam tower were built by the Birmingham Tank Company.

Both washed stock and brown stock chest are equipped with Impco side entering propeller type agitators. Agitation to maintain uniform consistency is difficult because of the nature of the mechanically-pulped semichemical stock. For this reason a vertical agitator is being installed in the washed stock chest.

Washed stock is pumped to a DeZurik regulator where consistency is adjusted to about 4 per cent before feeding by gravity to two Sprout Waldron refiners operating in parallel. These two units used for secondary refining are the same as those previously described. They discharge to a No. 6 Miami jordan or, when this is bypassed, direct to the suction of the stock pump that transfers the washed refined semichemical pulp to the pulp mill stock chest. Two triplex units pump the stock to the paper mill.

Here, instead of going direct to the semichemical pulp chest, it goes to the two Oliver combination deckers and save-alls where fiber in the unclarified white water from the paper machine is recovered. From here the thickened stock flows to the stock chest from which it is pumped to a consistency regulator and then to the stock proportioner. Most of the liquor pumps and stock pumps in the pulp mill were furnished by Goulds Pumps, Inc.

## Wastepaper Stock Preparation

The new No. 8 paper machine uses a furnish of about 80 per cent virgin semichemical pulp and 20 per cent wastepaper stock. This mixture operates better on the machine with fewer breaks than if semichemical pulp were used alone.

Waste corrugated containers and clippings are defibered in a continuous 12 ft diameter Shartle Hydrapulper equipped with a junk remover and regulator box. Unclarified white water is heated by passing through a heat exchanger before entering the Hydrapulper.

Hydrapulper stock passes over a riffler or trash remover with a Webster double strand drag conveyor which removes all heavy foreign material before being pumped to the Shartle decker with air operated couch. Thickened stock then drops into the unrefined wastepaper stock chest. From here the stock is pumped to a stuff box ahead of two 36-1 Sprout Waldron refiners that are arranged for either parallel or series operation. Both of these operate at 1,150 rpm and are driven by 125-hp motors.

Refined stock at about 4½ per cent consistency is further diluted with unclarified white water and flows by gravity to two Impco 10 plate flat screens in parallel. Rejects are discarded and accepted stock thickened on a second Shartle air couch decker before going to the refined waste paper stock chest. From this chest the stock is pumped to a DeZurik consistency regulator and thence to the stock proportioning system for No. 8 machine.

A third kind of stock that must be taken into consideration consists of paper machine broke. Slush stock from the broke beater is pumped to the couch pit where it is mixed with wet broke from the suction couch and any emergency overflow from the wet end. This is pumped to a consistency regulator before going to the proportioning unit.

## Paper Mill

No. 8 paper machine, producing 9-pt corrugating, uses a furnish consisting of about 20 per cent waste paper stock, a maximum of 15 per cent broke, and the balance of semichemical gumwood pulp. Since these arrive at the proportioning system at a controlled consistency, the resulting mixture can be carefully regulated. While not required at present, the proportion system is designed to handle size, alum, and color. Mixed stock at 3½ per cent consistency flows by gravity to the ma-

chine chest which holds about one hour storage for the paper machine. All stock chests are equipped with Impco agitators. From the machine chest the stock is pumped to the machine regulating headbox where the consistency is adjusted to 3 per cent and from which the stock flows by gravity to the two parallel Miami No. 2 jordans operating at 450 rpm and driven by 200 hp synchronous motors. Jordaned stock flows to a surge box and then to the machine fan pump.

Sonoco's No. 8 paper machine may seem unique in that major component parts were supplied by two machine builders. At Sonoco, however, this is not out of the ordinary since several of the paper machines now operating at this plant are made up of component parts, both old and new, of numerous builders.

Fourdrinier wet end and press section of No. 8 are built by Downingtown, while Bagley and Sewall furnished the complete dryer section, reel, and rewinder including mechanical sectional drives that also power the fourdrinier and press rolls. Close cooperation of these two paper machine builders with Sonoco's engineering staff aided the successful installation.

### Wet End

Designed for operating speeds from 150 to 1,000 fpm, the new machine has a wire width of 142 in, length of 92 ft, and a final sheet trim of 128 in at the reel.

A number of features have been incorporated in the machine by Downingtown to improve operation and to lessen downtime. Among these are the double suction box couch, cantilever type fourdrinier, corrupated stainless steel save-all pans, and double slice arrangement.

Stock from the surge box is mixed with white water in the Downingtown Economy fan pump and enters the machine headbox through a manifold inlet made up of five 8-inch connections controlled by rubber pinch valves. The headbox is constructed of stainless steel, baffled to provide several passes for evening the flow, and is equipped with two agitator rolls and a foam shower.

Two slices are provided. The high speed slice may be raised by a motor-driven mechanism for installing the unit designed for slow speed operation. Shake rails are stainless steel tubes and are built in two sections. The first carries the Ryertex making board, 13 table rolls and is connected to the breast roll. The second section carries 26 table rolls. The 24-inch diameter stainless steel breast roll and the 6-inch diameter aluminum constructed, rubber covered table rolls are all mounted in antifriction bearings. Breast roll and wire rolls are kept clean with individual doctor blades.

A double shake unit operates from a variable speed motor and V-belt drive. A parallel shake is imparted to the breast roll and first section of table rolls while an angular shake is applied to the second section of table rolls. Shake rail springs are laminated 3-ply beryllium copper mounted in rubber cushions.

Water is removed by nine stainless steel oscillating suction boxes, each connected to a separator box with wire reinforced rubber hose. A lever weighted relief valve controls the suction from the single Nash vacuum pump. All flat boxes have Ryertex covers and are supported by antifriction bearings in hinged brackets.

The 36-inch diameter suction couch roll is equipped with a double suction box, the first being 9 inches wide with a vacuum of 15 inches of mercury. The second box is 5 inches wide and carries a vacuum of 20 inches. Each box has a separate vacuum pump, with an air water separator.

Ease of wire changing results from the use of a cantilever type fourdrinier frame. Use of a cantilever arrangement on the back side of the machine permits the supporting blocks on the front to be removed leaving a gap for the wire to pass through. This same arrangement applies to the suction couch roll. To further aid in wire changes, all pipe connections to showers, deckle squirts, etc., are on the back side. The lump breaker roll and air roll are mounted on the press section and may be swung out of the way. The air roll is driven by an Elliott air motor and is raised and lowered by a Hannifin air cylinder.

### Press Section

Water is extracted from the sheet by two suction presses. Both first and second presses are identical with 24-inch diameter top rolls and 28¼-inch drilled face bottom rolls, all rubber covered. The first press is equipped with a broke conveyor and two Lodding oscillating doctors on the top roll, while the second press has only one doctor. Loading and lifting the top roll is handled by Hannifin air cylinders and Foxboro pressure controls. Each suction roll is hooked up to individual Nash vacuum pumps.

Both felts are of identical length and are cleaned by Vickery felt conditioners operated from a single vacuum pump. Felt rolls have quick opening hangers to facilitate changing of felts. Felt stretchers are motor operated. Gilbert and Nash automatic guides are employed for the press felts and the fourdrinier wire and dryer canvas.

All told, 66 rubber-covered rolls are used on the wet end. These include wire rolls, table rolls, lump breaker roll, felt rolls and press rolls. They were all covered by the Manhattan Rubber Company.

### Dry End

As mentioned before, the dry end of the machine was built by Bagley and Sewall. After leaving the second suction press the sheet passes beteween a pair of smoothing rolls before entering the dryers. The 48-inch diameter cylinders are driven in three sections of 18, 16, and 14 rolls, totalling 48 paper dryers and 6 felt dryers. Dryer canvas is used on all three sections.

Dryers are covered with a J. O. Ross Engineering Company hood built of Transite. Exhaust fans are located on the roof atop each of the 5 exhaust stacks. To permit passage of the 10-ton Maris bridge crane from the wet end to the dry end, each exhaust stack is designed with a sleeve section that can be raised for this purpose. These sleeves are raised or lowered by a system of overhead cables and hand winches.

From the 10-inch diameter spring roll following the last dryer, the sheet passes through a 9-roll motor-lift calender stack and then to a Pope type reel having a 42-inch drum. Maximum reel size is 66 inches.

Full reels are transferred to the unwinding stand by electric monorail crane. The B&S double drum winder has 18-inch drum rolls with a rider roll, shaft pulley and roll unloader.

While the winder is electrically driven the paper machine, from suction couch to reel, is driven by a B&S mechanical drive. The line shaft in the basement is powered by a 400-hp Westinghouse turbine using 375 psi steam. Leather belts on cone pulleys transmit motion from the line shaft to the sectional drive units on the machine room floor. Draws are controlled by adjustment of belts on the cone pulleys and individual sections are started and stopped with Fawick Airflex clutches controlled from the front side of the machine.

Exhaust steam from the drive turbine is used in the dryers. A Midwest-Fulton drainage and condensate return system returns condensate to the boilers. A Bowser lubrication system is used to lubricate dryer bearings on the machine.

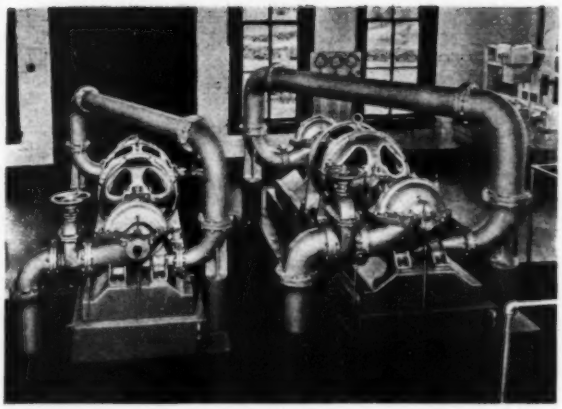


Fig. 1—Series units (motor in middle)

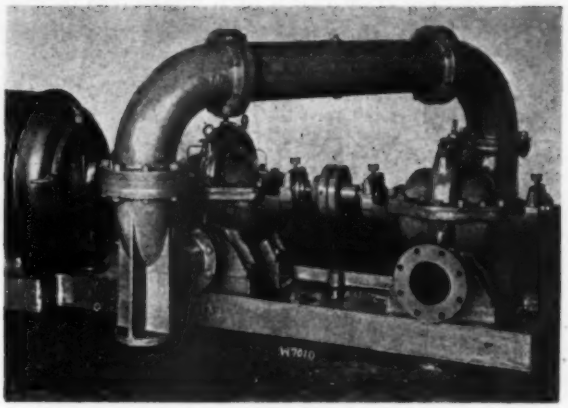


Fig. 2—Series unit (motor at the end)

# Multistage Pumps

**Part 3 of a series on centrifugal pumps. Fundamental information on the design and construction of centrifugal pumps will help those responsible for the selection, operation, and maintenance of this equipment.**

**Igor J. Karassik and Roy Carter**
**Application Engineers**
**Worthington Pump & Machinery Corporation**

▸▸▸ WHEN LARGE CAPACITY, medium high head service conditions require it, two single-stage, double-suction pumps may be connected in series on one baseplate with a single driver. Such an arrangement is common in waterworks applications for heads of 250 to 400 ft. One type of

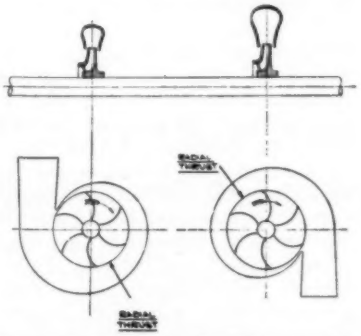



Fig. 3—Arrangement of multistage volute pump for radial thrust balance

series arrangement uses a double extended shaft motor in the middle, driving two pumps connected in series with interconnecting piping (Figure 1). In a second type, a standard motor is used and one pump is then furnished with a double extended shaft (Figure 2). The limiting factor of this latter arrangement is that the shaft of the pump next to the motor must be strong enough to transmit the total horsepower of the unit.

When the total pressure generated by such a series unit is relatively high, the casing of the second pump of the unit may require ribbing.

## Multistage Pump Casings

While the majority of single stage pumps are of the volute casing type, both volute and diffuser casings are used in multistage pump construction. The advantages derived from the use of volute casings have been described previously. .The diffuser type pump is used considerably in very high pressure applications, because it employs a symmetrical casing, excellently adapted to the vertically split forged steel construction and advantageous because of the simplicity of the castings involved. Its symmetrical form also permits a more uniform expansion under very high temperatures, such as are encountered, for instance, in boiler feed service. This, of course, applies specifically to extremely high pressure applications, such as 1,500 to 2,500 psi and to high temperatures over 350 Fahr.

Material from this article will be included in a book on centrifugal pumps now being prepared by the authors; hence, all rights to republication are reserved by the authors.

It has already been mentioned that a volute casing gives rise to a radial thrust which increases in magnitude appreciably with increased stage pressures. The design which has found most favor in the application of axially split multistage volute casings has been the use of staggered volutes in such a manner that the resultant of the individual radial thrusts is balanced out. This principle is illustrated in Figure 3, where it is applied to a two-stage pump.

## Axially and Radially Split Casings

Both axially and radially split casings have been and are being used for

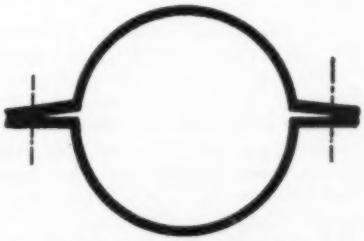


Fig. 4—Action of axially-split casing under excessive pressure

multistage centrifugal pumps. The existence of two basically different designs stems from the fact that there were two solutions for the problem of casing construction in the early days of the centrifugal pump. When each of these two designs was found to work satisfactorily, they were incorporated in

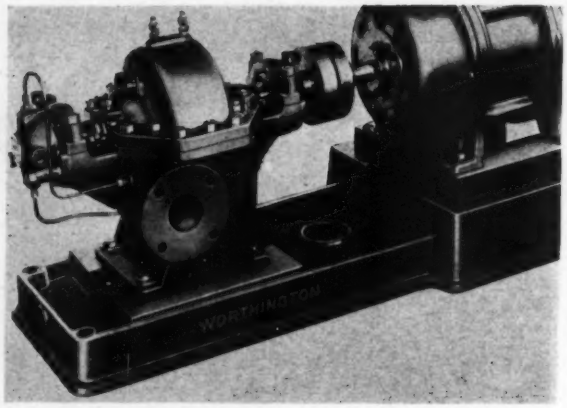



Fig. 5—Two-stage, axially-split volute pump for pressure capacities and up to 250 psi

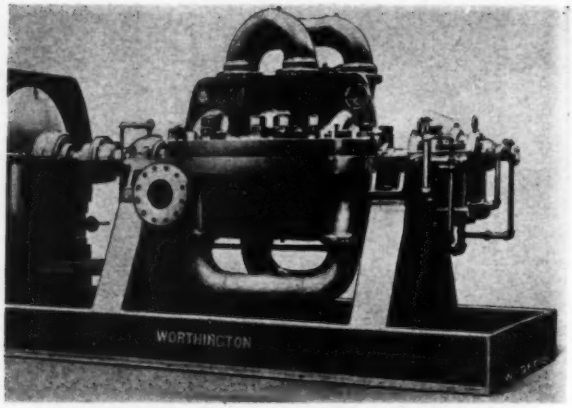



Fig. 6—Six-stage, axially-split volute pump for pressures up to 1250 psi.

subsequent pumps over a period of many years, each basic design following its own evolutionary progress.

Early centrifugal pumps had a vertically split casing, or rather, a casing with joints in a plane perpendicular to the shaft axis regardless of whether the latter was in a horizontal or vertical position. The idea of splitting the casing in a plane parallel to the axis of rotation was introduced to make centrifugal pumps more accessible for inspection and repairs.

Openings leading to the suction passages and from the discharge of the casing were located in the lower half, with the result that the upper half could be lifted and the rotor laid bare for inspection or removal without disconnecting the pump proper from either its foundations or from the suction and discharge piping. In other words (and this is the all-important factor in the development of the horizontally-split casing), the change was made strictly for reasons of convenience and expediency, mechanical considerations of strength or cost entering in no manner whatsoever into the decision.

As long as the range of pressures for which pumps were designed stayed within modest limits, the problem of strength and safety did not affect the wisdom of this decision. However, the working pressures increased to a point where the horizontally split casing began to show signs of inherent weakness, primarily because it became more and more difficult to keep the horizontal flange tight with higher pressures. The result of excessive working pressures on the horizontally split casing is illustrated in Figure 4, which shows the phenomenon commonly called "breathing" of the casing.

The first solution applied to avoid internal leakage and casing distortion resulting from this breathing was to increase the thickness of the horizontal flanges, stiffen the casing with properly located ribs and augment the number and size of the casing bolts. It is evident, of course, that even this solution was bound to lose its effectiveness once certain pressure limits were reached. The opinion of the various pump designers as to the proper location of the limits has varied considerably. As more experience is being constantly gained in the operation of axially-split casing pumps at the higher pressures, it is probable that the limiting pressures will be constantly tending to increase, until they stabilize somewhere around 1400 to 1500 psi.

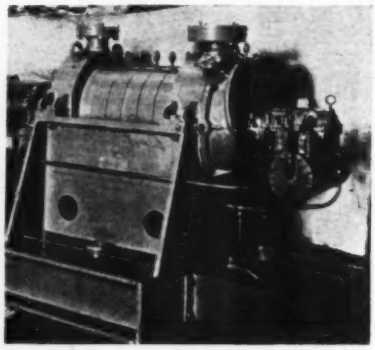


Fig. 7—Seven-stage, radially-split "ring casing" type pump

## Axially-Split Casings

In the low and medium pressure and capacity range, the interstage passages are cast integrally with the casing proper, as shown in Figure 5. As the pressures and capacities increase, the desire to maintain as small a casing diameter as possible, coupled to the necessity of avoiding sudden changes in the velocity or the direction of flow, leads to the use of external interstage passages cast separately from the pump casing. They are formed in the shape of loops, bolted or welded to the casing proper, as illustrated in Fig. 6.

Axially-split casing pumps are provided with a gasket at the split and, although several attempts have been made in the past to build multistage pumps with a metal to metal joint, they have not been very successful. In many cases, it is the practice to machine the flanges with a taper, in order to assure a tight gripping of the gasket at the inside areas of the casing, where leakage has a tendency to start if the joint is not tight.

## Radially-Split Casings

Oldest form of vertically-split casing multistage pump is that commonly called the "ring-casing" type or the "doughnut" type. When it was found necessary to use more than one stage for the generation of higher pressures, two or more single-stage units of the then prevalent vertically-split-casing type were assembled and bolted together. The general construction of this type of pump is illustrated in Figure 7. Casing barrel sections are made of forged or stainless steel, with one section per stage; the individual diffusers being inserted into the steel casing sections. Suction and discharge heads are likewise made of forged steel. Nozzles are located on the vertical centerline and form an integral part of the suction and discharge heads. Vertical joints between the individual casing sections and between the end sections and the heads make a metal-to-metal contact on ground surfaces. Heavy through-bolts hold the assembly together and insure tightness at the vertical joints.

Principal objection to this design is the inconvenience of the dismantling process. Not only is it necessary to dismantle such a pump piece by piece on its baseplate, but it is also impossible to carry out this process without breaking the suction and discharge connections.

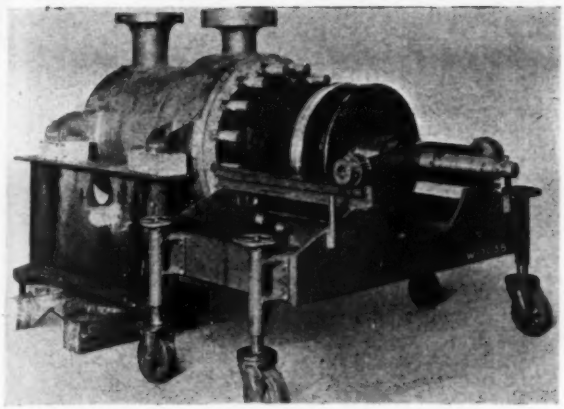


Fig. 8—Radially-split rotor assembly being inserted into outer casing barrel

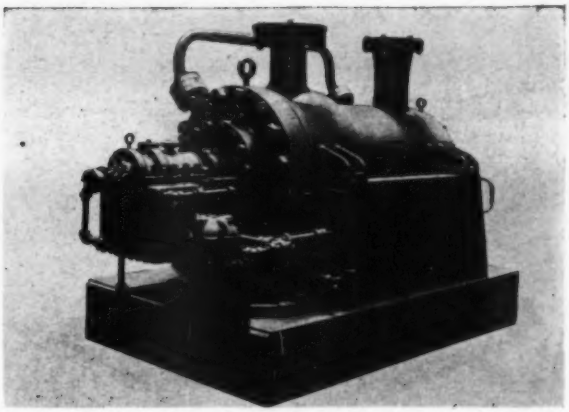


Fig. 9—Radially-split, double-casing pump

**Double Casing Pumps**

Desire to alleviate the dismantling difficulties of the "doughnut" type casing construction while still retaining the mechanical advantages of the vertically-split casing led to the use of the so-called "double-casing" pumps. The construction of double-casing high-pressure boiler-feed pumps has had a very interesting development and has evolved into types, similar in principle but different in conception.

Basic principles consist of enclosing the working parts of a multistage centrifugal pump in an inner casing and in building a second casing around this inner casing. The space between the two casings is maintained at the discharge pressure of the last stage of the pump. Construction of the inner casing follows either one of two opposite principles:

(a) Axially-split casing
(b) Radially-split casing

Of the two, the first is a simple evolutionary step from the usual low pressure practice of single-casing, horizontally-split pumps. Such a single casing is normally subjected to distortion and breathing, with consequent leakage at the horizontal split and between stages whenever the final discharge pressures exceed certain limits and unless the flange thickness and the bolting strength are increased beyond practical limits. When the casing is enclosed in a solid barrel structure of cast or forged steel, the outside of the horizontally-split casing is subjected to a pressure greater than the average internal pressure. The inner casing is under compression and the horizontal flanges will remain tight under any operating conditions. Generally, the inner casing of this type of pump is of the volute type.

The double-casing pump with vertically-split inner casing is an evolution of the usual ring-casing type pump, with provision for the ease of dismantling which the latter type of pump lacked. The inner unit is constructed exactly as a ring casing pump. After assembly, it is inserted into a forged steel cylindrical casing in which it is supported, free to expand under temperature changes. Figure 8 shows the rotor assembly being inserted into the outer-casing and the external appearance of the pump is shown on Figure 9.

Suction and discharge nozzles form an integral part of the outer casing in order to permit the removal of all interior parts of the pump without disturbing the pipe connections. These nozzles are located on the vertical centerline of the casing, either top or bottom, to prevent eccentric strains from the piping which might disturb the alignment of the unit. The most important advantage of the principles employed in this construction is that perfect symmetry is retained for all parts of the pump and that all the high pressure and all interstage joints are of the ring type, which is most easily held tight under high pressures.

# Houses Made from Sawdust May Be Built First in London

▶▶▶ NEW RAW MATERIAL from which homes may be constructed is now being processed in London.

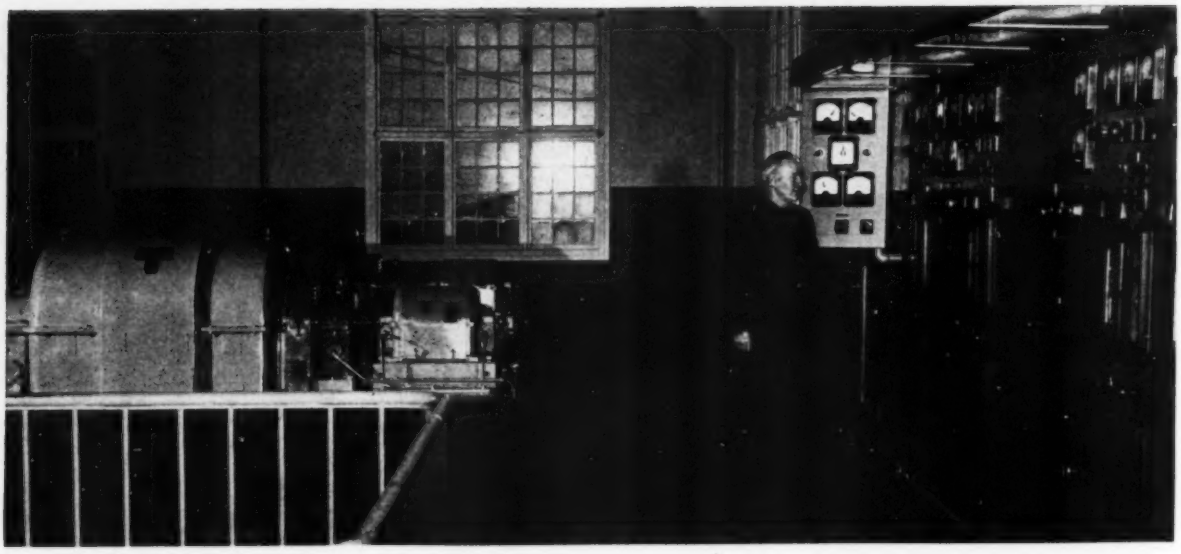
The material is sawdust—heretofore discarded by as much as millions of tons each year. The process is the fabrication of a new wood from this waste.

Leaders in the wallboard field and other leaders of industry from Sweden, Italy, Switzerland, England, and the United States recently gathered at Harvard University for the first international conference on wallboard. Before this auspicious gathering, Dr. Donald F. Othmer, professor and head of the department of chemical engineering at the Polytechnic Institute, described his process for making first quality new wood from available sawdust and shavings. He said that the leading timber importing firm in London has begun the fabrication of wallboards by his process. Louis Ricciardi, a research associate at Polytechnic Institute of Brooklyn, who developed the process with Dr. Othmer, is supervising the work.

The wood waste, Dr. Othmer explained, can be directly converted in 12 minutes into the finest quality construction material which is resistant to termites, rot, moisture swelling, and shrinking.

An innovation in the process which makes it the cheapest ever developed is the elimination of any resin or gluing agent to bind the particles together. By adding a small amount of a cheap, readily available chemical, the lignin in the wood itself, representing some 40 per cent of the wood content is made to do the gluing job, and it is reactivated to hold the fibers together as it did in the original wood. In other words, it

*(Turn to page 830)*



Turbine room with one of the 2500 kv-a turbogenerators at left

# Power Plant Insulation Prevents Heat Losses

**W. O. STEVENS**
**W. O. Stevens & Company**
**Consulting Engineers**

▸▸▸ WHEN THE HYDRAULIC barker with its increased power demand came into use at the Woodfibre (B.C.) plant of the British Columbia Pulp & Paper Company, additional power equipment was required. Also, increased costs of labor, hog fuel, and oil, as well as the age and efficiency of the old equipment, made the building of a new power plant highly desirable.

Detailed studies were made of present and future steam and electric power requirements, as well as of costs of equipment, material and labor, in preparation for designing the new plant. Special emphasis was given to accessibility, orderliness and convenience of operation. As a result of all this preliminary planning, the old boiler plant was replaced by a modern, well-coordinated plant which is easy and economical to operate and maintain.

An important, possibly critical, phase of the design and construction was the insulation of steam generating and handling equipment. Obviously, if over-all operational costs are to be kept to a minimum, heat losses must be kept to a minimum. Excessive heat losses are not only uneconomical, but also make for uncomfortable working conditions in the plant. Furthermore, inadequately insulated equipment may be a hazard to operating personnel since contact with hot surfaces may cause burns. Therefore, choice of insulating materials, thicknesses and methods of insulation application were fully investigated in drawing up the insulation specifications.

## Plant Design and Equipment

Plant loads on which the design of the power plant were predicated required the installation of 200,000 lb per hr of steam generating capacity. To meet the demand, and to provide for a standby unit, three 100,000 lb per hr boilers were installed, each operating at 570 psig and 725 Fahr. One of these units is designed to burn oil exclusively; the other two can be fired with either oil or hog fuel and the combustion chambers are of a size that will accommodate pulverized coal, if desired. The boiler room is arranged to permit the installation of suitable coal pulverizers and coal storage facilities.

Air preheaters were installed on each boiler, a justifiable expenditure in the light of fuel costs.

Due to the availability of high-pressure water, the need for an electrically driven boiler feed pump was eliminated and uniform heat balance is obtained under all conditions of load. Any two of the three steam-driven pumps can supply maximum requirements.

Steam at high pressure is utilized for the three 2500 kv-a turbogenerators and at 150 psig and 50 psig to drive auxiliary equipment and for process purposes. With the exception of piping on the turbines themselves, no piping is in evidence in the turbine room. The main steam pipe in the boiler room is run above the lower chord of the roof trusses. The H.P. steam header is located convenient to the central operating point in the boiler room.

## Insulating Materials and Procedures

The basic insulating material used in the plant is 85 per cent magnesia, a molded material consisting of magne-

sium carbonate to which asbestos fiber is added for the necessary binding and reinforcing qualities. It is used in the form of semicylindrical and segmental pipe sections and blocks, and also as a cement for insulating irregular surfaces, such as small fittings.

Where temperatures exceed 600 Fahr, 85 per cent magnesia is used in combination with an inner layer of a high temperature insulation, thus taking advantage of the resistance to the effects of high temperatures of the latter material and of the low heat conductivity of the magnesia.

Tables 1 and 2 list the insulation thicknesses used on piping and equipment, respectively. In drawing up these thickness specifications, factors such as heat production costs, operating temperatures, equipment size, heat loss, etc., were taken into account.

Depending upon shape of the surface to be insulated, blocks, sections or segments were applied to the surface, butted tightly together and wired in place. Joints in single and double layer construction were staggered and sealed with insulating cement so that heat would not escape through the joints.

All valves and fittings were insulated to the same total thickness of insulation as that on the adjacent piping. Although some insulation specifications do not call for the insulation of these items, it was considered desirable for two reasons. First of all, a surprisingly large amount of heat is lost if they are left uninsulated. Secondly, condensation and damage to equipment because of wet steam are greatly reduced if fittings are insulated.

On piping 4 inch and larger, the valves and fittings were insulated with magnesia blocks covered with a ½-inch coating of cement. The blocks were wired in place with No. 16 gauge annealed iron wire before the cement was applied. On pipe sizes of less than 4 inches, insulating cement alone was used on the valves and fittings. The cement was applied in two or more layers, as necessary, each being permitted to dry before the next was applied. This procedure is necessary if a tightly adhering, well-sealed job is to be obtained. On piping of all sizes, the valve bonnets were insulated up to the stuffing boxes.

Insulation on piping, fittings and valves was finished with a pasted canvas jacket.

On equipment such as the feed water heater, storage tank or the heat exchangers, the insulation blocks were anchored in place with ⅛-inch cables. The latter were firmly tied to clips, angles or similar anchorages previously welded to the equipment surface. Hexagonal galvanized wire mesh was stretched tightly over the insulation to serve as a base for an asbestos cement finish. The cement was applied in two layers, each ¼-inch thick, with the second layer containing ⅓ to ½ by weight of Portland cement to obtain a hard finish.

Boiler front and rear walls were insulated with block insulation applied with the longest dimension vertical and fixed in place with light wire cables and annealed iron wire lacings anchored to studs and bolts provided on the equipment for the purpose. The same procedure was followed on the furnace side, front and rear walls as well as on the boiler side walls (bare tube), ex-

**High pressure header and piping at left and deaerating heater and feedwater storage tank at right. Former insulated with a combination of high temperature and 85% magnesia insulation, and the latter with 85% magnesia. Pipe insulation is finished with pasted canvas and equipment insulation with cement**

**One of the 100,000-lb per hr steam generators, insulated with a combination of high temperature and 85% magnesia enclosed in a paneled steel casing**

cept that the insulation was applied over refractory tile backing. Hexagonal wire mesh and asbestos cement were then applied over the insulation. To prevent air infiltration and damage from passing equipment, ladders, tools, etc., the insulation was covered by a No. 10 gauge steel plate panelled casing designed for this type of steam generator.

Insulating blocks were fastened to the cylindrical surface of the steam drums by means of annealed iron wire laced through wire cables drawn tightly from previously installed anchorages. On drum heads, the blocks were secured by wires laced through wire cables looped around the surface of the shell and a wire cable looped around the manhole opening. A hard cement was used as a final finish.

Exposed portions of feeder and riser tubes were insulated individually in the same way as other piping. Exposed headers were insulated with block insulation and finished with hard cement.

Where there are widely spaced stiffeners on the surface of the air ducts and flues, insulation blocks were applied directly to the surface between the stiffeners. The stiffeners were also insulated, to avoid a source of heat losses, as well as to prevent warping of the metal and scorching of the finish on the adjacent insulation. Since the stiffeners project beyond the duct insulation, pipe and block insulation was built up around them and wired in place.

Where the stiffeners were closely spaced, V-rib metal lath was fitted over the surface and fastened by means of cables. This serves as a foundation for the block insulation which was wired firmly to the lath.

All duct and flue insulation was finished with a ½-inch layer of a mixture of asbestos and Portland cement applied in two coats.

**TABLE 1—Thickness of Insulating Materials for Piping**

| Service Temperature, Deg F | Pipes larger than 4 in. | Pipes 2 in. to 4 in. | Pipes smaller than 2 in. |
|---|---|---|---|
| *Thickness of 85% Magnesia (Inches)* | | | |
| 212 to 266 | Std.* | Std. | Std. |
| 267 to 337 | 1-1/2 | Std. | Std. |
| 338 to 387 | 2 | 1-1/2 | Std. |
| 388 to 499 | Dbl. std. | 2 | 1-1/2 |
| 500 to 600 | 3 | Dbl. Std. | 2 |

| Nominal Pipe Sizes, Inches | Thickness of Insulation, Inches: High Temperature | 85% Magnesia |
|---|---|---|
| *Service Temperature 600-699 Fahr.* | | |
| 1-1/2 & smaller | Single layer only of high temperature, 2 in. thick | |
| 2 | 1-1/4 | 1-1/2 |
| 2-1/2 | 1-5/16 | 1-1/2 |
| 3 | 1-9/16 | 1-1/2 |
| 4 | 1-9/16 | 1-1/2 |
| 5 & larger | 1-1/2 | 1-1/2 |
| *Service Temperature 700-799 Fahr.* | | |
| 1-1/2 & smaller | Single layer only of high temperature, 2 in. thick | |
| 2 | 1-1/4 | 2 |
| 2-1/2 | 1-5/16 | 2 |
| 3 | 1-9/16 | 2 |
| 3-1/2 | 1-5/16 | 2 |
| 4 | 1-9/16 | 2 |
| 4-1/2 | 1-5/16 | 2 |
| 5 & larger | 1-1/2 | 2 |

*"Standard" and "double standard" are terms used in the insulation field to refer to a series of pipe insulation thicknesses that are made to fit the various pipe sizes.

**Table 2—Thickness of Insulation Materials for Equipment**

| | |
|---|---|
| Boiler and furnace walls | 1-1/2 in. high temperature<br>1-1/2 in. 85% Magnesia |
| Steam drum and drum heads | 3-1/2 in. 85% Magnesia |
| Feeder and riser tubes | 2 in. 85% Magnesia |
| Headers | 2-1/2 in. 85% Magnesia |
| Air heater and outlet to I. D. fan outlet | 2 in. 85% Magnesia |
| Gas flues | 2 in. high temperature<br>2-1/2 in. 85% Magnesia |
| Air duct to burner windbox | 3 in. 85% Magnesia |
| Deaerating feed water heater, feed water storage tank, continuous blowdown heat exchanger, grate cooling water heat exchanger | 1 in. 85% Magnesia |

## Houses Made from Sawdust . . .

*(Continued from page 827)*

causes the wood to recombine with itself into a strong, grainless board which actually has many advantages of new wood. The cost of the chemical is only one or two tenths of a cent per square foot.

In the face of the country's diminishing wood stocks the salvage of the wood now lost in sawdust and shavings amounting to 30 and sometimes as much as 80% of the original log would add twice as much production to our lumber supplies. It is estimated, Dr. Othmer said, that approximately 20,000,000 tons of sawdust and related fine shavings and chips are the residue of lumber production in this country.

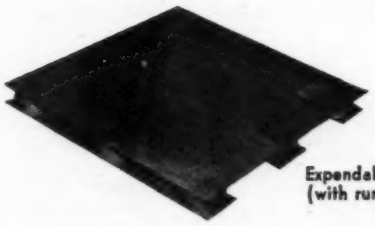
Dr. Othmer disclosed that 2000 square feet of his wallboard can be made from a ton of waste. Thus if all the waste could be salvaged, 40,000,000,000 square feet of new wallboard would be produced each year.

For commercial operation a minimum plant for fabricating the new sawdust boards would require about 25 tons a day of wood waste which would produce approximately $1,000,000 worth of wallboard a year at a chemical cost of approximately $40,000. The initial plant could be set up at a cost not exceeding $400,000.

Dr. Othmer pointed out that such a plant represents a mere fraction of the cost of plants now producing an equivalent amount of wallboard by other processes.

The Othmer process consists simply of mixing a small amount of a chemical with the dry wood waste, then placing the material in an hydraulic press equipped with multiple heated platens which can make from 10 to 20 boards at one time. In a matter of from 10 to 12 minutes the boards are formed and discharged to cool.

In addition to sawdust from all of the common species of wood, residue from other vegetation operations such as bagasse remaining from sugar cane after the sugar has been extracted can be utilized to make the wallboards. Another advantage in using sawdust, Dr. Othmer said, is the plastic character of the material which can be molded into any shape desired such as finished doors requiring no carpentry, panels and moldings. Since the board can be molded in almost any desired size and thickness, pre-fabricated walls, ceilings, floors and roofs for factory built houses are possible.

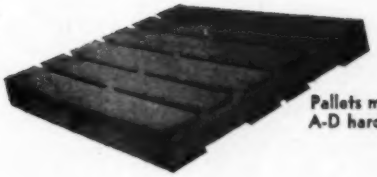


Expendable pallet (with runners)

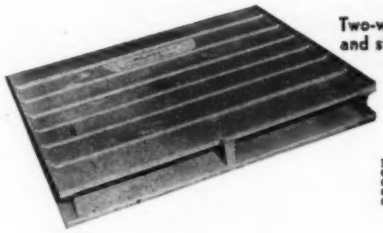
Lightweight 8-way all-steel pallet

# Pallets Save Money

**T. F. MORIARITY**
**Yale & Towne Manufacturing Co.**



Pallets made of A-D hardwoods



Two-way wood and steel pallet

Expendable pallet of corrugated board

Photos courtesy of: Powell Pressed Steel Co., Hubbard, Ohio; Monroe Auto Equipment Co., Monroe, Mich.; Bigelow-Garvey Lumber Co., Chicago, Ill.; and Addison-Semmes Corp., Racine, Wis.

▶▶▶ FIVE YEARS AGO most pallets were made of softwood or hardwood. Today, they are built of steel, aluminum, molded pulp and fiber. A wirebound wood design also is available. A very recent addition is the wire type usually built with collapsible sides to form a bin unit.

Millions of plain wooden pallets are now used by thousands of firms that have adopted the system. Held securely by drive screw-type nails, they stand up well and, where made of hardwood, they are said to be capable of giving years of service with a small maintenance cost.

Single-faced pallets—those that have a single deck supported by two or three wooden stringers—are the choice where loads are not to be tiered. For stacking two or more high, the double-faced type (two decks with stringers between them) are considered best. The lower deck prevents damage to the goods on the bottom loads.

Where heavy loads are transported in plants and warehouses, many firms prefer a metal unit, as experience has proved that the wooden type in this service requires frequent repairs and replacement within a year or two. While the initial cost is three to five times as much as the wooden design, they are often cheaper in the long run.

When pallets are shipped loaded to customers via motor truck or by freight car, it is conceded that a very substantial permanent type be used, provided it is to be returned time and again for reloading.

A large percentage of firms prefer to use the *expendable* (one trip) pallet that is sturdy enough to withstand the handling in transit. The transportation charge on "empties" encourages many firms to select this "giveaway" pallet, but where the quantity used is very large, shipment in truckload or carload lots makes it feasible to standardize on the permanent type.

Before establishing a pallet system, the cautious buyer will secure samples of several types, both expendable and multitrip, and test them thoroughly. The cost of practically every type of pallet manufactured is offset by the time saved.

The buyer will get just about what he pays for in terms of pallet life. The wire-bound wooden pallets, light but sturdy, will stand up for a dozen round trips, according to the manufacturers. It is claimed by the makers of metal pallets that they are almost indestructible.

There is a choice of two-way or four-way entry pallets. The latter can be handled by manually-operated or power trucks from both sides and ends, which, in some plants, is an important advantage. In congested quarters, it is admitted that the four-way type is superior.

These savings are assured where loads are palletized . . . by eliminating the picking up and laying down of the separate pieces—by permitting the swift transfer of huge loads with little effort by the operator of the power truck—the speedy tiering of loads to add 200 per cent to 400 per cent more value to the floor space.

Other savings not so much publicized are reduction of damage bills, greater safety of workers, and elimination of much of the production interruptions. All these benefits are available where the system is confined to the plant.

When pallet loads are sent out of plant, substantial savings are made in reduced packaging expense and, of course, the loading expense for shipper is cut sharply. At the other end, the unloading job is speeded up and the savings to consignees builds good will.

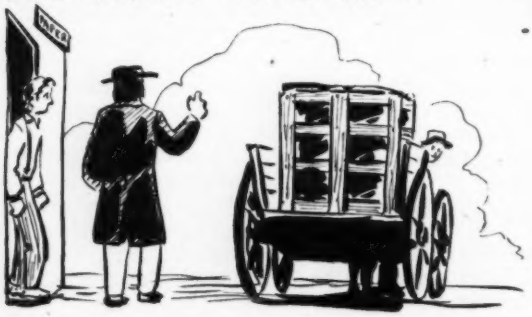
The ideal type of pallet never may be available. To some this would be an exceptionally lightweight unit, very low in cost, and with a long-life expectancy.

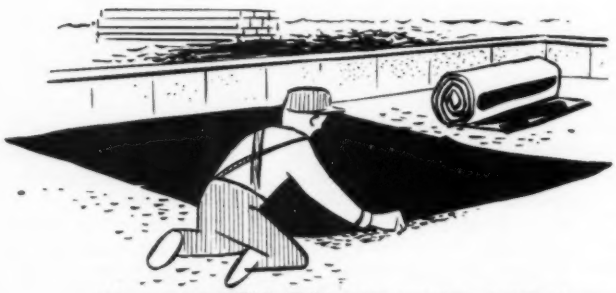
# PAPER SKETCHES

IN THE LATE 1890's, SOME BLACKSMITHS IN CHICAGO SHOD HORSES WITH SHOES MADE OF WATERPROOFED SHEETS OF PAPER THAT HAD BEEN LAMINATED TO THE PROPER THICKNESS.

**The** ANCIENT CHINESE MADE PAPER FROM CEREAL STRAW. THEY FIRST SOAKED THE STRAW IN LIME WATER — BOILED IT — THEN SUBJECTED IT TO A STAMPING PROCESS.

**Beet Sugar** MACHINERY WAS USED IN THE MAKING OF UTAH'S FIRST "NATIVE" PAPER IN 1854. THIS PAPERMAKING OPERATION WAS INTERRUPTED SOME SIX MONTHS LATER WHEN THE MACHINERY HAD TO BE RETURNED TO THE SUGAR COMPANY THAT OWNED IT.





**IT HAS BEEN FOUND** THAT ASPHALT ROOFING PAPER LAID ON THE SOIL UNDER BASEMENTLESS BUILDINGS HELPS PREVENT SOIL MOISTURE FROM ARISING, VAPORIZING ON SILLS AND JOISTS, AND ROTTING THEM.

# Why

No single type of dryer felt will meet the needs of all mills. But HOOPERWOOD "Canvas Engineering" has the answer to that problem—a specific HOOPERWOOD Dryer Felt for each requirement.

If it is a rugged, heavy felt you need for fine finish in normal production . . . or a lightweight, extra-porous felt for faster drying . . . or an Asbestos Felt to withstand advanced temperatures in high speed production of Kraft and other heavy papers—there is a HOOPERWOOD felt to fit your need.

Mill Superintendents find this service invaluable in suiting the particular requirements of their mill—even down to each machine position if desired.

Make your next felt *right*—specify HOOPERWOOD.

**WM. E. HOOPER & SONS CO.**
New York **PHILADELPHIA** Chicago
Mills: **WOODBERRY, BALTIMORE, MD.**

# Engineered

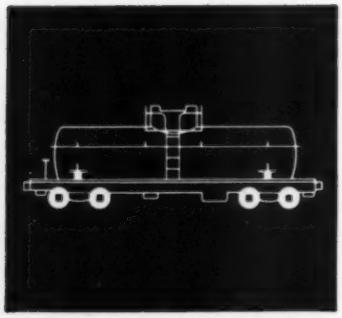
## DRYER FELTS

Photo courtesy of the Pusey and Jones Corp.

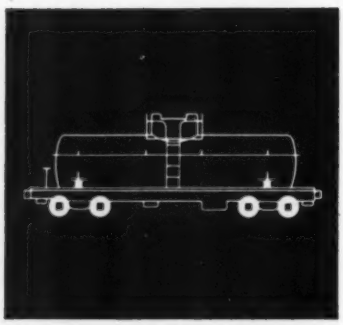
# HOOPERWOOD DRYER FELTS

## COTTON AND ASBESTOS

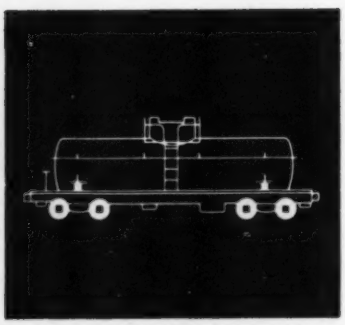
# 3 ways to cut bleaching costs with Caustic Soda



**1** Because less labor is required in unloading, storing and using liquid caustic soda, handling costs are substantially reduced.



**2** Soda bleach foams less in the washers than other bleaching chemicals. Draining and drying of the pulp are faster and more economical.



**3** The use of soda bleach insures a cleaner finished paper, with a minimum reversion of brightness.

Caustic Soda provides several cost-saving advantages in the preparation and bleaching of wood, rag, straw and wastepaper pulps.

As one of the world's major producers of this basic alkali, Wyandotte Chemicals Corporation is in a good position to meet your needs for Caustic Soda promptly and dependably. In addition, Wyandotte's experienced technical staff stands at your service. For information, simply call your nearest Wyandotte Representative.

**Wyandotte Chemicals Corporation**
Wyandotte, Mich. • *Offices in Principal Cities*

SODA ASH • CAUSTIC SODA
BICARBONATE OF SODA
CALCIUM CARBONATE • CHLORINE
HYDROGEN • DRY ICE
GLYCOLS • SYNTHETIC DETERGENTS
CARBOSE (Sodium CMC) • ETHYLENE DICHLORIDE
PROPYLENE DICHLORIDE • CHLOROETHERS
AROMATIC SULFONIC ACID DERIVATIVES
OTHER ORGANIC AND INORGANIC CHEMICALS

Wyandotte
REG. U. S. PAT. OFF.

# Names in the News...

## GILBERT HEATH IS PAPER MILL SUPT. AT FT. EDWARD PLANT OF MARINETTE PAPER

The appointment of Gilbert L. Heath as paper mill superintendent at the Fort Edward, New York, plant of the Marinette Paper Company has been announced by the Scott Paper Company, of which Marinette is a subsidiary.

Associated with Scott since 1937, Mr. Heath, as chief field operations engineer, was responsible for the rearrangement of pulp preparation facilities at Fort Edward, and reconstruction and installation work on paper machines there.

Gilbert L. Heath

Riley M. Owens

## OWENS MADE GEN. REPR. CORN PRODS. DEPARTMENT ANHEUSER-BUSCH, INC.

Announcement was recently made of the appointment of Riley M. Owens as general representative of the corn products department of Anheuser-Busch, Inc., St. Louis.

Mr. Owens will have his headquarters in the company's New York offices at 33rd Street and 12th Avenue, and will be active throughout the East, where he is well-known in the corn refining industry.

▼

## MORE RESPONSIBILITY GIVEN TO THREE ABSCO EXECUTIVES

Three executives of the Brake Shoe and Castings Division of American Brake Shoe Company, New York, have assumed more responsible positions. Joseph H. Parsons and Robert B. Pogue have been appointed vice presidents and Rosser L. Wilson has been made chief engineer.

Mr. Parsons, formerly assistant vice president, will be in charge of miscellaneous castings sales. He has been with the company since 1913, following his graduation from Princeton.

Mr. Pogue, formerly chief engineer, will continue in charge of engineering. He has been chief engineer of the division since 1937 and associated with the company since 1916. Mr. Wilson, formerly assistant chief engineer, joined the organization in 1935.

▼

▶▶▶ *D. E. Williard* has been appointed manager of industrial cleaning equipment and chemical sales for the central region of the United States for Detrex Corporation, Detroit. Mr. Williard has been with Detrex for over 15 years and has had wide experience in various sales, service, and production phases of the company's business. He has been a key figure in the development of solvent vapor degreasing as well as alkali and emulsion cleaning.

▼

## JAMES SHATTUCK RESIGNS FROM K-C TO RE-ENTER YALE —ROBERT MOTT SUCCEEDS

Robert H. Mott is the new editor of Kimberly-Clark's *Cooperation*. He began his new task with the last issue. However, Mr. Mott has been associated with the company since 1930 and has made many contributions to the magazine he now edits.

James Shattuck, former editor, has resigned from K-C to re-enter Yale University. He returns to complete a course in Industrial Administration which was interrupted several years ago.

▼

## CHAIN BELT CO. ANNOUNCES SEVERAL PERSONNEL CHANGES

Election of a new vice president and several other organizational changes have been announced by the Chain Belt Company of Milwaukee, effective September 1.

William J. Sparling is the newly elected vice president and manager, of the chain and transmission division. Since 1945, he has been works manager. Joining the company in 1928 as a student engineer, he has been successively in charge of the metallurgical laboratory, assistant to the chief engineer of the above mentioned division, assistant works manager, and finally works manager.

E. P. Meyer succeeds Mr. Sparling as works manager. He has been with the company since 1920 and has served as assistant works manager since 1945.

Roscoe O. Byers was appointed factory manager of the chain and transmission division. He was formerly production manager of the Milwaukee plants of the company.

Clarence B. Ringham is now factory manager of the heavy machinery divisions, which includes the conveyor and process equipment division and the construction machinery division. He was previously superintendent of two of the company's plants.

George B. Flanigan, newly appointed manager of trade relations, has held executive positions on the Milwaukee staff as well as being district sales manager in Chicago and later in New York.

▼

## WARREN CHILSON IS SALES MGR. OF CURLATOR CORP.

The appointment of Warren A. Chilson as sales manager of the Curlator Corporation, Rochester, New York, has been announced.

Mr. Chilson formerly was adviser to the late president of Northern Paper Mills, Green Bay, Wisconsin. He takes to his new association a wide variety of experience in pulp, paper, and paperboard mills covering a period of over 24 years. During his career, he has held positions in research, development, operating, sales, sales service, and management branches of the pulp and paper industry. He is a member of TAPPI, also of the Canadian Pulp and Paper Association.

Warren A. Chilson

Dr. R. M. Pickens

## DR. PICKENS MADE VICE PRESIDENT IN CHARGE OF SALES BY RAYONIER, INC.

Technical sales director of Rayonier Incorporated, New York, Dr. Russell M. Pickens, has been elected vice president in charge of sales. Dr. Pickens has been with the company since 1930, at which time he was appointed technical director to initiate an extensive research program to develop a new source of supply of purified wood cellulose for use in the manufacture of rayon and cellophane. In 1944, he became technical sales director.

Dr. Pickens was graduated from Montana State College in 1920 with a B.S. degree. He did graduate work

at Iowa State College, receiving his M.S. degree in 1922, and his Ph.D. in chemistry in 1925. He is a member of the American Chemical Society, American Institute of Chemical Engineers, and the Technical Association of the Pulp and Paper Industry.

▼

▶▶▶ *John L. Bagg* has retired as president and treasurer of the Millers Falls Paper Company, Millers Falls, Massachusetts. He began his papermaking career with the Parsons Paper Company 30 years ago.

*R. Farley Chapin* has been elected acting president and general manager in Mr. Bagg's place.

*W. J. Hosmer* was elected treasurer of the company.

▼

## FREDERIC LACKENS HAS RETIRED FROM HAYS CORP. TO RESIDE IN FLORIDA

After 12½ years as advertising manager of The Hays Corporation, Michigan City, Indiana, Frederic I. Lackens has retired. He will reside in Fort Lauderdale, Florida, where he has purchased a home. Mr. Lackens will, however, spend some time each summer at Coldwater Lake in southern Michigan.

Mr. Lackens is well known in many circles. He served as national president of the N.I.A.A. for 1943-1944. He also was president of Engineering Advertisers Association (now Chicago Industrial Advertisers Association) in 1943-1944.

▼

▶▶▶ *Walter J. Maytham, Jr.,* has been made Pacific coast district manager of the Westinghouse Electric Corporation. He will be located in the San Francisco office. He has been manager of the company's Industrial Division since 1944.

*Charles A. Dostal,* who will be succeeded by Mr. Maytham, is retiring next May after 43 years of service with the company. In addition to his office as vice president, he has been in charge of the company's sales in the Pacific Coast states, Alaska, and the Hawaiian Islands.

▼

## I. P. CO. MAKES CHANGES IN SALES REPRESENTATIVES

Appointment of a new sales representative has been announced by International Paper Company's Bagpak Division early in September. Hugh O'Neill will represent the company in northwestern Ohio, northern Indiana, and Michigan, except the peninsula. His headquarters will be in Cleveland at 2408 Terminal Tower.

W. W. Hendrickson, who previously covered this territory, will continue as sales representative in the sections of Ohio and Indiana not covered by Mr. O'Neill, and in Kentucky, Buffalo and Niagara Falls, New York. His headquarters is also in the Cleveland office.

The northern peninsula of Michigan will continue to be covered by H. D. Wellington whose office is in Chicago.

▼

▶▶▶ *John Mitchell,* formerly retail salesman in the Hyster Company's Chicago store, (headquarters of the company is in Portland, Oregon) has been promoted to the position of district manager of truck sales for the northeastern section of the country. His background includes several years as a materials handling engineer.

*John Cusick,* who has been with the company since 1944, has been named lift truck sales district manager, responsible for the central portion of the United States.

*W. J. O'Brien* is the new district manager of the southwestern territory.

*C. E. Houston* has become district manager in the northwest district.

*Fred Schultz* at the same time was appointed district manager in the southeastern part of the United States.

▼

## HERBERT RANDALL AND WIFE HAVE MIRACULOUS ESCAPE FROM A BURNING CRUISER

Aboard their cabin cruiser at Drummond, Michigan, September 17, Mr. and Mrs. Herbert T. Randall (Champion Paper and Fibre Co.) had a narrow escape from fire which broke out during the night.

They escaped in a small boat and spent the night on the beach. The cruiser was destroyed.

▼

▶▶▶ *William Woosnam,* formerly sales manager of Holyoke Machine Company, Holyoke, Massachusetts, has taken a similar position with the Appleton Machine Company, Appleton, Wisconsin.

▼

▶▶▶ *Stephen Florio,* who was connected with the American Tissue Mills from 1934 to 1944, and was later with Fabricon Products, Inc., River Rouge, Michigan, has been appointed vice president and general manager of the Marvellum Company, Holyoke, Massachusetts.

▼

▶▶▶ *Lawrence M. Ricketts, Jr.,* was elected vice president and assistant treasurer of the Poole Foundry & Machine Company, Baltimore, Maryland, at the September 7 meeting of the company's board of directors.

▶▶▶ *James H. Sweet* has resigned as vice president in charge of sales and advertising for the American Writing Paper Corporation, Holyoke, Massachusetts. He has been appointed vice president and general manager of Keith Paper Company, Turners Falls, Massachusetts.

*John G. McNaught* has become sales manager in charge of sales and advertising at American Writing Paper.

*Fred Curtis* continues as sales manager in charge of technical and industrial papers for AWP.

*William H. Shine,* sales representative connected with the New York office of the company, has resigned to join the Mohawk Paper Company of New York. Mr. Shine had been with American Writing for 31 years.

▼

## ROBINSON AND SHARP GIVEN NEW POSITIONS BY BROWN

Appointment of John A. Robinson as regional sales manager for the Midwest, Northwest, Rocky Mountains, and Pacific Coast areas has been announced by the Brown Instruments division of Minneapolis-Honeywell Regulator Company, Minneapolis, Minnesota. He will make his headquarters in Chicago where he has been branch industrial manager.

This appointment is in line with company plans to extend the sale of its products in new markets, and to meet a growing demand for industrial instrumentation in the West.

Charles E. Sharp has succeeded Mr. Robinson as Chicago branch industrial manager for Brown. He has been with the Chicago office for the past five years. Both men started with the Brown company at its Philadelphia main plant about 20 years ago.

▼

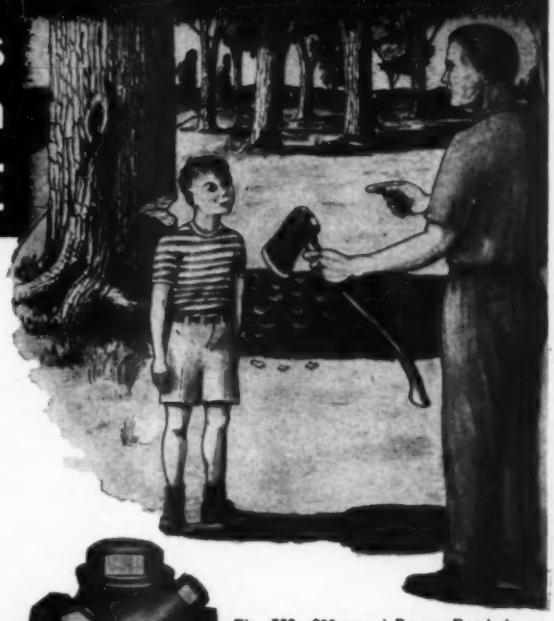
▶▶▶ *Harold W. Hillier,* assistant technical director at the Marinette, Wisconsin, plant of the Marinette Paper Company (a Scott Paper Company subsidiary) has been selected by Scott to attend the Institute of Paper Chemistry for the 1949-50 school year as a special student. Mr. Hillier has a B.S. degree in chemical engineering from Syracuse University, and has held positions at the Chester, Pennsylvania, and Empire, Oregon, operations of the company.

▼

▶▶▶ *John Butler,* corrugated container salesman for Union Bag & Paper Corporation in the Southeastern territory, has been appointed to a special sales assignment, James L. Knipe, vice president in charge of corrugated container sales, has announced. Mr. Butler's new headquarters will be in

# "Don't send a boy to do a man's work"

## There's a Powell Valve* that's just *right* for every known FLOW CONTROL SERVICE



Most valve failures are the result of misapplication . . . installing valves that aren't of the right design or sturdy enough to do the job for which they are selected. In other words, it's like "sending a boy to do a man's work."

On the other hand, it's a waste of money to specify costly valves for services where less expensive ones may be used. This amounts to putting a man on a job that a boy can do.

To avoid misapplication: (1) standardize on Powell Valves; (2) consult Powell Engineers as to which valves are specifically adapted to each and everyone of your individual flow control requirements.

Powell makes such a *complete* Line* that there is a Powell Valve *exactly* suited to every existing service, from the simplest to the most specialized or exacting. Ask your nearest Distributor—or write direct.

Fig. 560—200-pound Bronze Regrinding Horizontal Swing Check Valve with screwed ends, screwed-on cap and regrindable, renewable bronze disc.

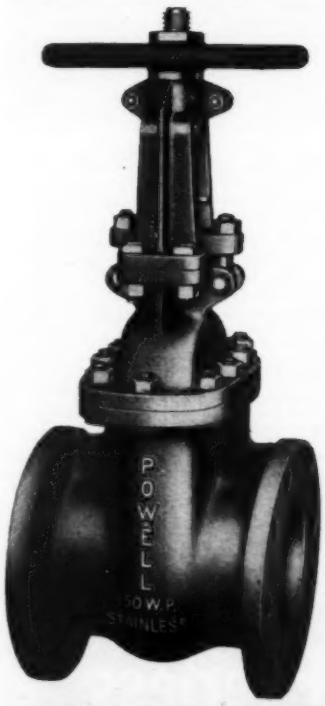



Fig. 2453-G—Large 150-pound Stainless Steel Gate Valve. Bolted flanged yoke-bonnet, outside screw rising stem and tapered solid wedge. Made in sizes 5" to 30", inclusive.

Fig. 500 — 125-pound Bronze Gate Valve with screwed ends, screwed-in bonnet, inside screw rising stem and tapered wedge: solid in sizes ¼" to ¾"; double in sizes 1" to 3".

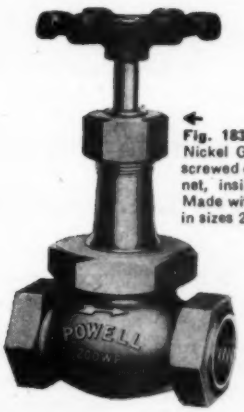



Fig. 1837 — 200-pound Nickel Globe Valve with screwed ends, union bonnet, inside screw stem. Made with bolted bonnet in sizes 2½" and 3".

Fig. 1828 — 200-pound Monel Metal Gate Valve with screwed-in bonnet, screwed ends and inside screw rising stem.

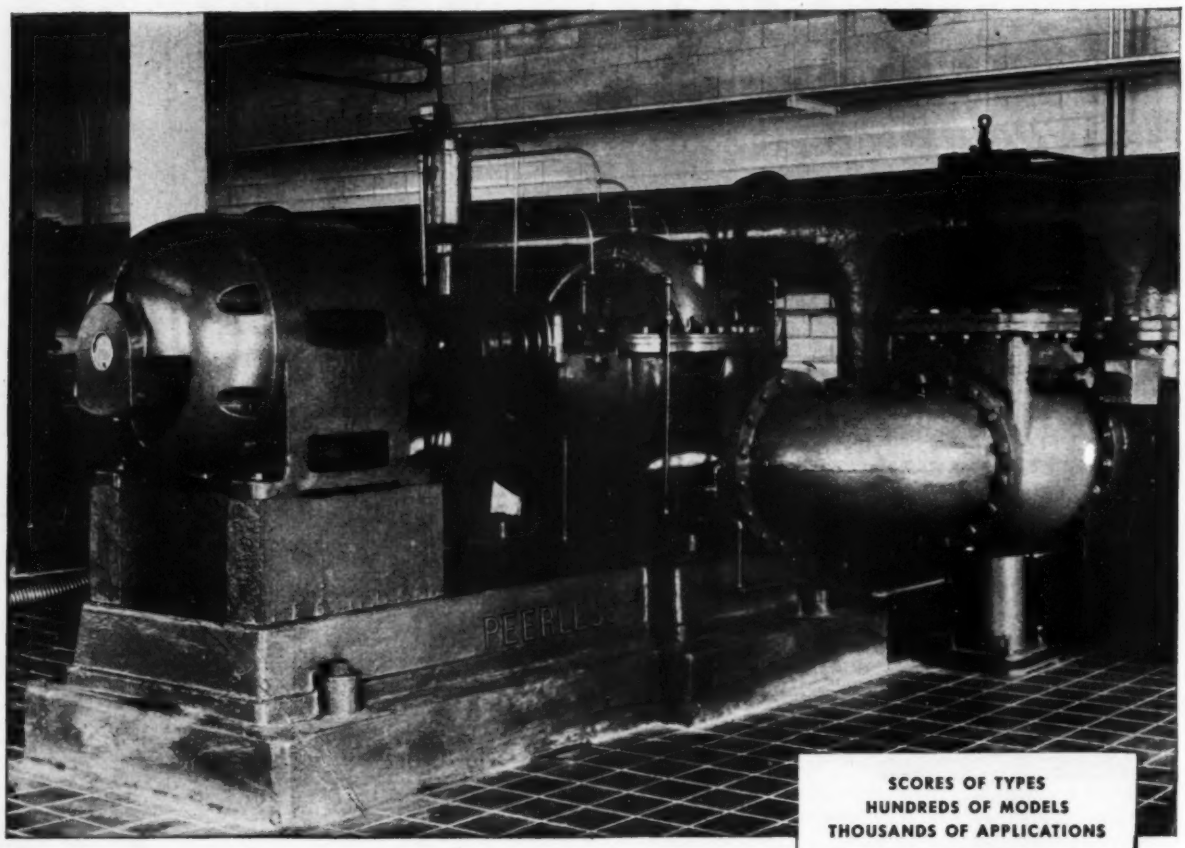
* Powell Valves are made in Bronze, Iron, Steel and a wide selection of Corrosion-Resistant metals and alloys. Valves of every type—Globe, Angle, Gate, Check, Non-return and Flush Bottom Tank Valves—are included in the Complete Powell Line.

**The Wm. Powell Company, Cincinnati 22, Ohio**

DISTRIBUTORS AND STOCKS IN ALL PRINCIPAL CITIES

# POWELL VALVES

# PEERLESS HORIZONTAL CENTRIFUGAL PUMPS



## For continuous or intermittent duty in a host of diversified services

Select the pump you need for the process you use from the diversified line of Peerless horizontal pumps. The pump shown above, a Peerless general purpose pump handling plant process water, typifies a host of efficient Peerless centrifugal pumps which are boosting output and cutting costs for manufacturers and municipalities everywhere. With its comprehensive line of horizontal pumps Peerless can handle chemicals or alkaline liquids, pump clear water or solids in suspension. There are pumps for fluids at high temperatures or they can furnish water or foam for approved plant fire protection. Peerless will move volatile butane-propane or tricky caustics and acids. Pumps are available for all practicable heads and capacities. Duty can be continuous or intermittent. Construction materials are suited to the liquid being pumped. And, backing up their installation qualified Peerless field engineering service is available in all principal cities to see that each pump matches or exceeds customer expectations. Write today for pump engineering information on your process or service. The chart at right lists a number of the types of Peerless horizontal centrifugal pump bulletins in which you will be interested.

**SCORES OF TYPES**
**HUNDREDS OF MODELS**
**THOUSANDS OF APPLICATIONS**

Here are a few of the services which Peerless horizontal pumps can perform. Plan with Peerless. Request copies of the Bulletins you need by Bulletin number.

| Pump Service | Bulletin No. |
|---|---|
| Water Supply | B-1300 |
| Fire Protection | B-1500 |
| Chemicals and Oils | B-810 |
| Vaporous Liquids | B-2201 |
| Butane-Propane | B-2200 |
| Boiler Feed | B-806 |
| Sewage and Solids | B-154 |
| Hi-Pressure | B-310 |
| Acids and Caustics | D-2400 |
| Process Services | B-803 |
| All-purpose Pumps | B-2301 |

**Peerless**
VERTICAL AND HORIZONTAL
**Pumps**

fmc
PEERLESS PUMPS

**PEERLESS PUMP DIVISION**
**FOOD MACHINERY AND CHEMICAL CORPORATION**
Los Angeles, California — Indianapolis, Indiana
*District Offices:* New York 5, 37 Wall St.; Chicago 40, 4554 N. Broadway; St. Louis 8, 3908 Olive St.; Atlanta Office: Rutland Bldg., Decatur, Ga.; Omaha, Nebr., 4330 Leavenworth St.; Dallas 1, Tex., 3905 Elm St.; Fresno, Calif.; Los Angeles 31, Calif.

the company's New York office. Prior to his association with Union Bag in 1947, Mr. Butler was with the Container Corporation of America.

▼

## C. BENSON BRANCH NOW HEADS DOW'S TECHNICAL SERVICE AND DEVELOPMENT

Announcement was recently made of C. Benson Branch's appointment as manager of The Dow Chemical Company's technical service and development division. He has been in charge of the coatings and raw materials section of the firm's plastics division.

The technical service and development division is responsible for market studies and the sale and development of new products, as well as the performance of technical service for the company's customers.

In his 12 years with the company, Mr. Branch has been closely associated with the paper, plastics, paint, rubber and petroleum industries.

C. Benson Branch

Rolland H. Bradford

## EBASCO OPENS OFFICE IN CHI.—BRADFORD HEADS IT

The new Chicago office of Ebasco Services Incorporated, located at 209 South LaSalle Street, will be managed by Rolland H. Bradford, a native of Missouri, who has spent more than 20 years with the Ebasco organization and its affiliates. Headquarters of this international firm of engineers, constructors, and business consultants is in New York City.

Mr. Bradford is a graduate of the University of Arizona, with a B. S. in civil engineering. His background includes diversified experience in utility operation, and during World War II he served as a major with the Corps of Engineers.

▼

▶▶▶ *Phillips B. Hoyt* has been named director of purchases of the American Car and Foundry Company, New York. He succeeds A. A. Borgading who retired August 31 after forty-two years of service. Mr. Hoyt will have executive and administrative control of ACF's procurement of carbuilding and other materials.

▶▶▶ *Arthur Cherry* has become associated with the Union Bag & Paper Corporation, New York, as sales representative for the Memphis area. He will supervise sales of all Union products except multiwall bags. Prior to this appointment, Mr. Cherry had over 20 years experience with Albermarle Paper Manufacturing Company in both manufacturing and selling, and also worked in a sales capacity for Blair Stringfellow Associates.

▼

▶▶▶ *Fred O. Benson's* appointment by Flexible Steel Lacing Company, Chicago, as sales representative for Illinois was recently announced. He will take over most of the territory formerly covered by Sam Baker who retired last year after serving the company for 31 years.

▼

▶▶▶ *James C. Banks* has been appointed special sales representative to the pulp and paper industry for the Felker Bros. Manufacturing Company, Marshfield, Wisconsin, according to a recent announcement by Ivo A. Umhoefer, company vice president in charge of sales. Mr. Banks formerly was connected with Walker Welding & Machine Company, New Lisbon, Wisconsin.

▼

▶▶▶ *Leon H. Perry* has been appointed to head the water wheel department of the Holyoke Machine Company, Holyoke, Massachusetts, manufacturers of machinery for the paper and textile industries. He was formerly with James Leffel & Company, Springfield, Ohio, the Charles T. Main engineering firm of Boston, and the Rodney Hunt Machine Company. He is a member of the American Society of Mechanical Engineers.

▼

## HARRY FIEBERTS ADDED TO LUKENS ENGINEERING STAFF

Another specialized paper machinery man has been added to the development engineering staff of Lukens Steel Company, Coatesville, Pennsylvania. Harry W. Fieberts as a sales engineer will further augment the force of experienced personnel being built into the company's organization for the development of machinery and equipment for the pulp and paper industry.

Previous to his employment by Lukens Mr. Fieberts was chief engineer, Eastern Division, at Philadelphia, for the Container Corporation. His experience includes positions as mill manager of the Fort Orange Paper Company, Castleton, New York, and plant manager and engineer of Dominion Boxboards, Ltd., Toronto, Canada. He was also works engineer for The Upson Company, Lockport, New York, and following his graduation from the Illinois Institute of Technology, Chicago, was associated with a paper mill designing engineer there.

Harry W. Fieberts

Hendley N. Blackmon

## HENDLEY N. BLACKMON IS AGAIN WITH WESTINGHOUSE

As assistant manager of engineering association activities, Hendley N. Blackmon's return to Westinghouse Electric Corporation has been announced. He will be headquartered at the East Pittsburgh plant and will work with company engineers in the preparation of papers to be presented before engineering associations.

Mr. Blackmon was continuously connected with Westinghouse from 1925 until 1945 when he resigned to join McGraw-Hill Publishing Company as electrical editor of *Product Engineering*. He became managing editor of that publication in 1946, and a year later was appointed to the same position with *Electrical World*.

During his long association with Westinghouse, Mr. Blackmon was on the staff of the company's Technical Press Bureau, first as technical editor, later as manager, which position he held when he left the company. He is well known throughout the paper industry.

▼

▶▶▶ *Edward P. Stamm,* of Portland, Oregon, logging manager for Crown Zellerbach Corporation, has been named chairman of the executive committee of the newly-formed forest conservation committee of Pacific Northwest Forest Industries. The committee, representing chiefly a move permitting broadening of membership, succeeds the joint committee on forest conservation of the West Coast Lumbermen's Association and the Pacific Northwest Loggers Association.

▼

▶▶▶ *Wesley F. Rennie's* appointment as executive director of the Committee for Economic Development was announced the middle of September by CED Chairman W. Walter Williams. Mr. Rennie has been associate general

secretary of the World's Committee of Young Men's Christian Associations since 1947, and since the 1945 United Nations Conference in San Francisco, at which he was a Y.M.C.A. observer, he has been closely associated with U. N. activities.

▼

▶▶▶ *J. J. Woodworth* was appointed sales manager of the Wright Hoist Division of American Chain & Cable Company, Inc., effective September 1, with headquarters at York, Pennsylvania. Mr. Woodworth has been with the division for over 25 years. He succeeds A. R. Haskins who is resigning from the company October 15 to establish a business in Milwaukee, Wisconsin.

▼

▶▶▶ *Gaylord E. Seger* of Livingston, New Jersey, has been appointed plant manager of the Continental Can Company plant at Utica, New York. Mr. Seger, a native of Ravenna, Ohio, has had wide experience in papermaking, paper converting, personnel work, and industrial engineering.

▼

▶▶▶ *Gordon W. Butler* recently joined the Dixie Cup Company as manager of sales personnel and training. He has had many years experience in sales training work, and was formerly associated with the Radio Corporation of America, Victor Division.

▼

▶▶▶ *Frank J. Lovegren* was recently transferred from the technical department to the production department of W. C. Hamilton & Sons, Miquon, Pennsylvania, and appointed to the position of stock preparation supervisor.

▼

▶▶▶ *Edward J. Sullivan* has been appointed eastern sales manager of Gould Paper Company, a subsidiary of the Continental Can Company. His headquarters will be in the New York offices of the company. He was formerly associated with the sales activities of Oxford Paper Company.

▼

▶▶▶ *George Wing Sisson, Jr.*, president of the Racquette River Paper Company, Inc., Potsdam, New York, observed his 87th birthday September 12. He has made a good recovery from his recent illness, and visits the business section of the village nearly every day.

▼

▶▶▶ *David I. McCready,* formerly with Somers, Fitler & Todd Company, Pittsburgh, has joined the sales staff of Graton & Knight Company, Worcester, Massachusetts. He will travel the Western Pennsylvania, West Virginia, and Virginia territory with headquarters at Pittsburgh.

▼

▶▶▶ *Charles F. Chaplin* has become associated with Allied Paper Mills, Kalamazoo, Michigan, as Chicago sales manager. He has been vice president and sales manager of Dwight Brothers Paper Company, Chicago, and earlier was district sales manager for The Champion Paper and Fibre Company, Hamilton, Ohio.

▼

▶▶▶ *Harry E. Lewis* has been assigned to the foreign and export department of the Worthington Pump and Machinery Corporation, Harrison, New Jersey. He was formerly works comptroller at the company's Holyoke, Massachuetts, plant.

*George Bourque* has been appointed works comptroller to succeed Mr. Lewis.

▼

▶▶▶ *Emerson D. Ogle* has been appointed manager of the industrial sales department of SKF Industries, Inc., Philadelphia. He succeeds C. D. Cummings, resigned. Mr. Ogle joined the company in 1937 as an engineer trainee upon graduation from the University of Maryland, and for the last two years has been manager of the automotive and electrical section of the industrial department.

▼

▶▶▶ *Don Buhrer* was recently made manager of New York sales of primary bulk products for Clinton Industries, Inc., Clinton, Iowa. Transferred from the Chicago office of the company, he will be responsible for sales of Clinton corn syrup, bulk starch, dextrose and other bulk products. He started his career in the corn processing business 15 years ago.

▼

▶▶▶ *Robert E. Bundy* has been appointed vice president in charge of production at Fibreboard Products, Inc., San Francisco. He succeeds N. M. Brisbois, who is retiring under the pension program, but will continue for one year as consultant.

*B. P. Altick* was named assistant to the general manager of the company at the same time.

▼

▶▶▶ *John Corbett* has been appointed purchasing agent for Appleford Paper Products Limited, Hamilton, Ontario.

▼

▶▶▶ *J. T. Murnane* has been appointed industrial sales manager for Pittsburgh Plate Glass Company's paint division at Newark, New Jersey. He succeeds the late C. A. Roebuck, who served in the position for 24 years. Associated with the company's paint division since 1925, Mr. Murnane has represented the firm in the Baltimore district until his present appointment.

▼

▶▶▶ *Thomas M. Barry* has become assistant manager of Hollingsworth & Whitney Company's Northern Mills. His most recent connection was with Fraser Paper, Limited at Madawaska, Maine, where he was mill manager. Mr. Barry is a graduate of the University of Toronto, with a degree in chemical engineering.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English China Clays Sales Corporation

551 Fifth Avenue, New York City

# Piping equipment for every installation...

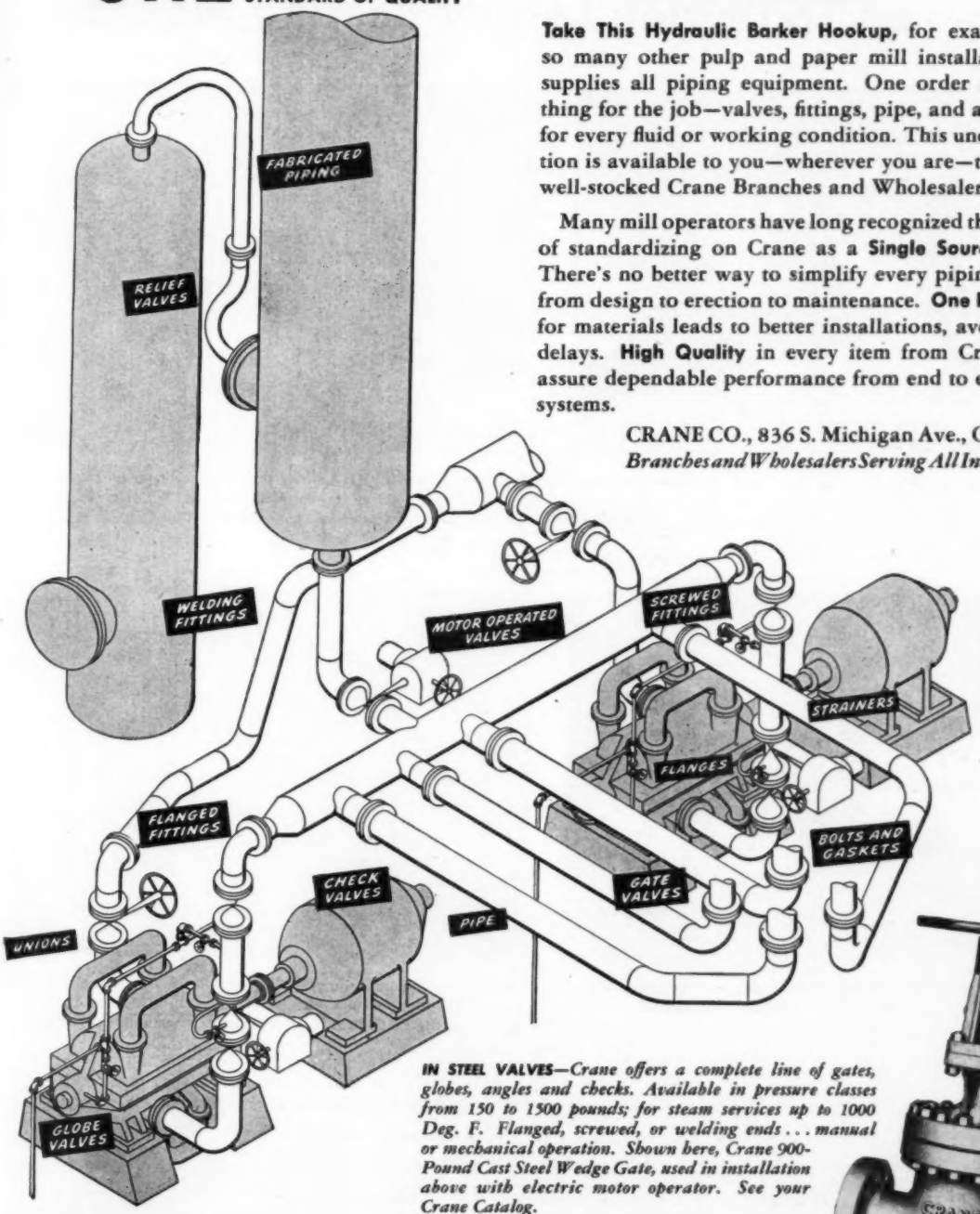
## ONE SOURCE OF SUPPLY RESPONSIBILITY STANDARD OF QUALITY

## on one order to CRANE

**Take This Hydraulic Barker Hookup,** for example. As in so many other pulp and paper mill installations, Crane supplies all piping equipment. One order covers everything for the job—valves, fittings, pipe, and accessories... for every fluid or working condition. This unequaled selection is available to you—wherever you are—through local, well-stocked Crane Branches and Wholesalers.

Many mill operators have long recognized the advantages of standardizing on Crane as a **Single Source of Supply.** There's no better way to simplify every piping procedure, from design to erection to maintenance. **One Responsibility** for materials leads to better installations, avoids needless delays. **High Quality** in every item from Crane helps to assure dependable performance from end to end of piping systems.

CRANE CO., 836 S. Michigan Ave., Chicago 5, Ill.
*Branches and Wholesalers Serving All Industrial Areas*




*Piping hookup to pumps and accumulators in a high-pressure hydraulic barker system.*

***IN STEEL VALVES**—Crane offers a complete line of gates, globes, angles and checks. Available in pressure classes from 150 to 1500 pounds; for steam services up to 1000 Deg. F. Flanged, screwed, or welding ends... manual or mechanical operation. Shown here, Crane 900-Pound Cast Steel Wedge Gate, used in installation above with electric motor operator. See your Crane Catalog.*

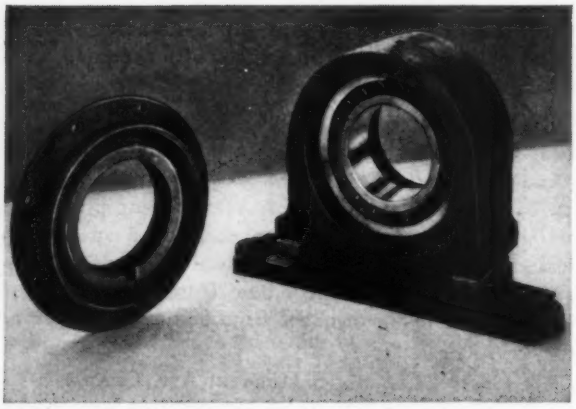
EVERYTHING FROM...

VALVES • FITTINGS
PIPE • PLUMBING
AND HEATING

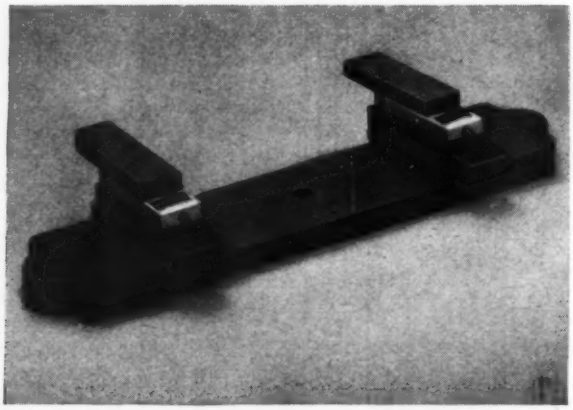
# CRANE

FOR EVERY PIPING SYSTEM

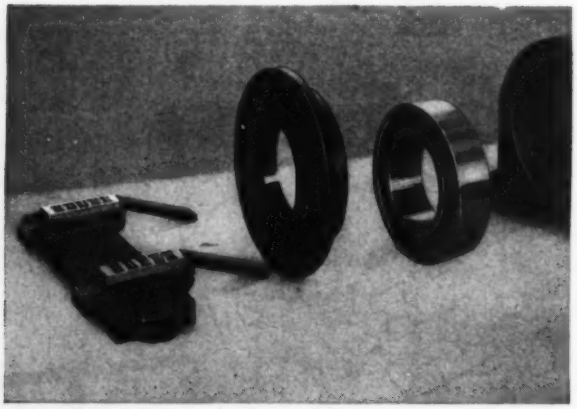
# Paper and Felt Drier Cylinders Expand and Contract Freely on Torrington Ladder Bearing Mounting



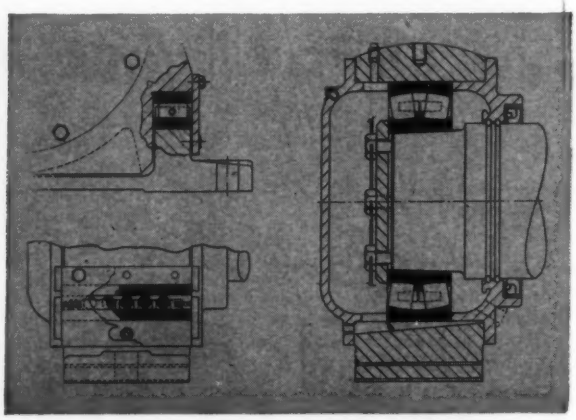
Many paper machine drier sections are being equipped for more reliable operation with the Torrington Ladder Bearing mounting for the tending side of paper and felt drier cylinders. In this design, the housing is free to move axially.



Two special Torrington Ladder-type Roller Bearings support the load with many times the capacity needed. Yet they leave drier cylinders free to expand and contract with anti-friction ease.

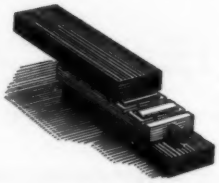


The combination with Torrington Self-Aligning Spherical Roller Bearings provides ideal operating conditions. One end of the shaft is fixed accurately, and proper alignment is automatically assured.



As this cross-section shows, all elements of the mounting work together to prevent the development of binding stresses from shaft deflection, frame distortion or cylinder expansion or contraction.

Reliable operation, low starting and running friction, reduced felt wear, and minimum maintenance are assured by this Ladder Bearing tending side mounting. Our engineers will be glad to work with you on details of this or any other special or routine friction problem. Write us today. THE TORRINGTON COMPANY, South Bend 21, Ind., or Torrington, Conn. District offices and Distributors in principal cities.



## TORRINGTON BEARINGS

**Spherical Roller • Tapered Roller • Straight Roller • Needle • Ball • Needle Rollers**

# Allied . . . . . .

## WESTINGHOUSE WILL BUILD HUGE MOTOR FOR SHIPMENT TO PAPER MILL IN FINLAND

One of the largest motors ever designed for a paper-forming machine will be built by Westinghouse Electric Corporation, East Pittsburgh, Pennsylvania, for delivery to the Enso-Gutzeit paper mill in Finland. The announcement was made recently by R. H. Harris, sales manager of Westinghouse Electric International Company.

The big 1,250 hp, d-c motor will provide all the driving power necessary for the various sections of the block-long, paper machine by driving a line-shaft extending the length of the machine. Power is transmitted from this shaft to the various sections of the machine by belt and gear arrangements.

The Enso-Gutzeit machine is capable of producing a continuous web of paper 192 inches wide at a speed of 1,500 fpm.

The electrical equipment to be supplied by Westinghouse and built at East Pittsburgh will include a 1,000-kw synchronous motor-generator set for supplying power to the motor, complete control including a Rototrol rotating type of paper machine speed regulator and other auxiliary equipment such as 250-hp "winder" drive.

The order, valued at $143,000, was negotiated through the Westinghouse Electric International Company.

▼

## COOPER ALLOY ANNOUNCES CONTEST—PRIZES FOR THE BEST TECHNICAL PAPERS

Cash prizes totalling more than $5,000 are to be offered by The Cooper Alloy Foundry Company, Hillside, New Jersey, for the best technical papers submitted in accordance with the rules of its proposed essay contests. The purpose of the contests is to stimulate interest in existing applications for cast stainless steel, and to encourage further advances in industry's constant battle against the ravages of corrosion. The present intention of the company is to cover the major fields of application, including: paper and pulp, chemical, textile, food, aircraft, petroleum, marine, etc.

The chemical field has been selected for the first contest. Papers dealing with "Applications for Cast Stainless Steel in the Chemical Industry" will be accepted between October 1, 1949, and May 1, 1950. Prizes, conditions, specific rules and dates for the other proposed contests will be announced at a future date.

Prizes for papers in the chemical industry contest are: $250 for the first prize, $150 for the second, and $100 for the third prize, plus 100 additional prizes consisting of beautifully designed cast stainless steel paper-weights. Complete information concerning the contest and rules may be obtained by writing the Contest Editor in care of the company.

▼

## DISTRICT OFFICE CHANGES EFFECTED BY AMERICAN LUMBER & TREATING CO.

In order to provide closer personal contact with treated lumber distributors and users, a realignment of sales responsibilities for two district offices of the American Lumber & Treating Company (Chicago) has been announced.

C. D. Bird has been appointed district sales manager of the newly organized South Central sales region with offices in the Exchange Building, Little Rock, Arkansas. Mr. Bird was formerly Middle Atlantic district manager in Washington, D. C. Following his new appointment, the Washington office will be closed.

J. P. Johnson, Jr., formerly sales representative in Philadelphia, succeeds Mr. Bird as district sales manager of the Middle Atlantic region, and has located his office at the company's Baltimore, Maryland, plant.

In his new territory, Mr. Bird will be responsible for the sales of Wolmanized pressure-treated lumber, Minalith fire-retardant wood, and creosoted forest products to the lumber and construction industries in Arkansas, Mississippi, Louisiana, Oklahoma, and Texas. Three of the company's ten wood-preserving plants are located in the South Central district at Crossett and Fordyce, Arkansas, and Shreveport, Louisiana.

▼

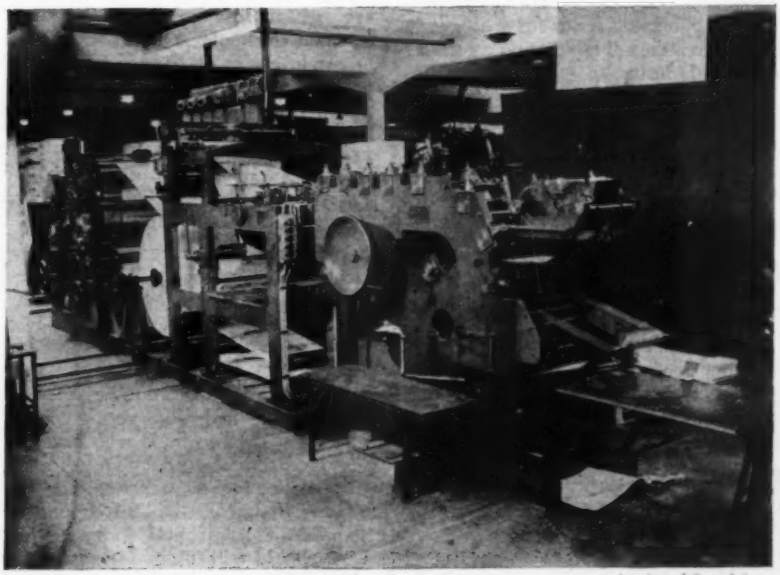
## LINK-BELT HAS OPENED A NEW OFFICE IN DULUTH

A district sales office has been opened in Duluth, Minnesota, by the Link-Belt Company's Minneapolis plant. (Main offices of the company are in Chicago.) The new office will be located at 422 Board of Trade Building, 301 West First Street, Duluth.

John E. Morrison, formerly district sales engineer in Chicago and Minneapolis, has been appointed district manager in charge of the office, and he will be assisted by Harold A. Ivarson, transferred from the Minneapolis plant, where he handled the city desk and called on customers locally.

The Duluth office has been established to serve customers of the company in northeastern Minnesota, northern Wisconsin, and the upper peninsula of Michigan.

Mr. Morrison, a graduate civil engineer from the University of Minnesota,



Nilsa Bag Machine in combination with Nilsaton Multi-color Printing Press, introduced to American converting trade by Sandy Hill Iron and Brass Works

grew up in Duluth and has since supervised the construction of dams, tunnels, industrial plants, powerhouses and aluminum plants for Byllesby Engineering & Management Company, the Minneapolis-St. Paul Sanitary District, and Aluminum Company of America, prior to his association with Link-Belt in 1944. Since January, 1949, Mr. Morrison has served the North Central territory in the capacity of sales engineer, with headquarters in Minneapolis.

▼

## DEMONSTRATION OF CO. EQUIPMENT SHOWN BEFORE CLARK'S BOARD OF DIR.

Latest developments in materials handling equipment produced by the Clark Equipment Company were recently shown to directors of the company assembled at Buchanan, Michigan, for the regular quarterly meeting.

Fork-lift trucks equipped with the new Dynatork Drive were shown, and among the handling attachments demonstrated were: the new Pul-Pac, which handles unit loads assembled on load-base sheets of corrugated paper or similar material, eliminating the conventional pallet; the Hi-Lo Stack, a high-lift, low-clearance device; the Barrel Clamp that grips cylindrical items or containers, up-ends them and rotates them; and the Rotating device that carries and dumps boxes of small parts, scrap material, and similar items.

▼

## AMERICAN POLYMER BEGINS PRODUCTION AT NEW PLANT

On September 10 the American Polymer Corporation began production at its new plant near Springfield, Illinois. American Polymer specializes in designing polymeric resins for the paper, leather, textile, adhesive, and protective coatings industry.

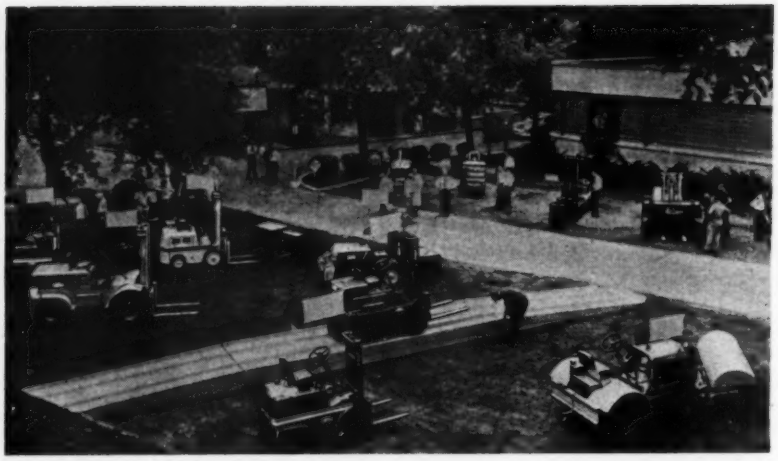
The equipment at the new Springfield plant includes facilities for polymerizing vinyl, acrylic, methacrylic, styrene, acrylonitrile, allyl and similar polymers. George Marshall has been appointed superintendent and Richard Pease chief chemist of this new unit.

▼

## RELIANCE PROVIDES SERVICE TO EUROPEAN PURCHASERS

Extension of application engineering services to European users of its electric motor drives and related equipment was inaugurated early in September by The Reliance Electric & Engineering Company, Cleveland, Ohio, with the departure of Clarence J. Marx to establish headquarters for such services in England.

Mr. Marx's immediate responsibilities will be to supervise the "tune-up" of Reliance equipment on projects now going into operation in England, France, Sweden, Austria, Italy, and Belgium. In addition, he will be available to assist foreign representatives of American machinery manufacturers who have electrical equipment problems to be solved. Work already scheduled includes installations in the paper, steel, textile, and rubber industries, and machine tool applications in a score of other fields.



Latest developments in Materials Handling equipment demonstrated for Clark Equipment Company's board of directors during its regular quarterly meeting

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## EDGAR BROS. PASS NEW CAPITALIZATION PLAN— EMPLOYEES NOW CONTROL

A recent announcement by James Deshler II, president of Edgar Brothers Company, outlines a plan under which the voting control of the company has passed to its employees. Under this new recapitalization, all of the large common stockholders either sold stock to employees or exchanged it for new preferred stock.

This plan, Mr. Deshler states, was made possible through the practical generosity and far-sightedness of members of the Edgar family, who, by adopting the plan and by maintaining their investment in the corporation, have expressed their confidence in the company, its management, and its future. No change in current company policies or operations is expected as a result of employees acquiring voting control. In fact, the company's general position is expected to be considerably strengthened, since voting control now has passed to those who have determined company policy and directed its operations for a number of years.

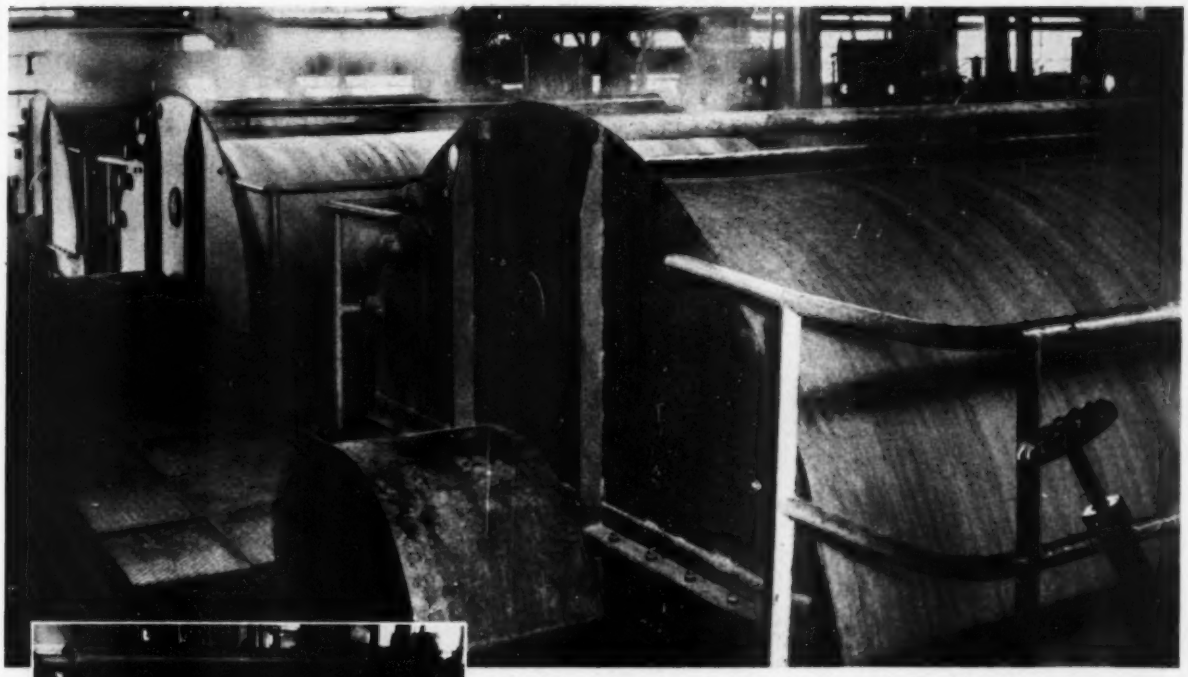
It is significant that this important step in the company's corporate history, should take place during its Fiftieth Anniversary Year. Incorporated in 1899 under the leadership of Charles S. Edgar, the company was formed to produce domestic clays using water washing techniques developed by Mr. Edgar, in New Jersey about 1875 and in Florida during 1892. Ten years after its incorporation, Charles S. Edgar began operations in McIntyre, Georgia. The company is currently completing a postwar expansion program whereby its Georgia facilities have been expanded to meet the needs of American industry for a water-washed, controlled particle-size clay. A pioneer in bringing domestic clays to the paper trade, the company's chief products today are filler clays and coating clays sold to the paper industry.

▼

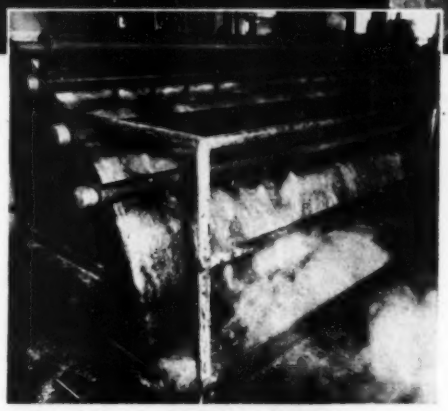
## LICENSE FOR NEW PROCESS AWARDED NIAG. BLOWER CO.

The license to manufacture dehumidifying and air conditioning equipment using a hygroscopic liquid has been awarded to the Niagara Blower Company, of New York and Buffalo, by the Research Corporation, New York. This new process promises much improvement in the handling of many materials that pick up unwanted moisture, such as, paper, textiles, chemicals, and synthetic materials, as well as foods and drugs. There are also applications to industrial drying and process air conditioning, and in preventing moisture damage to electrical and metal products. New equipment to make the liquid absorbent dehumidifying method commercially available is now being designed.

In the method developed by Research Corporation's scientists, air is dehumidified by contact with a liquid spray which absorbs the moisture from the air stream passing through the equipment. The dehumidifying liquid, as it is diluted by the airborne moisture, is automatically reconcentrated in ap-



Three-drum five-stage Swenson-Nyman Pulp Washing System in operation on Kraft board pulp.



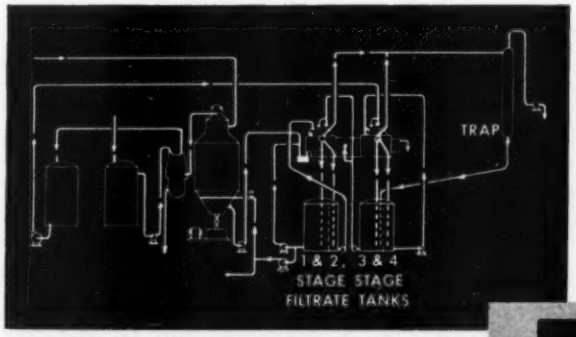
Close-up showing sheet formation and liquor shower arrangement on middle drum of same installation.

# PULP WASHING

## with less dilution lower chemical loss lower steam consumption

The Swenson-Nyman Pulp Washer, now in operation in many leading pulp mills, is bringing substantial economies in both chemicals and fuel. Closed system eliminates spillage and low dilution, reduces the evaporator load, and hence steam requirements.

Today's trend is toward an increasing number of washing stages, with repulping between drums. Each drum of the Swenson-Nyman Pulp Washer provides 2-stage washing. Four, five, and six stages of washing are practical. Fully described in Bulletin F-104 . . . free on request.




Flow sheet of a 2-drum, 4-stage installation

- Black Liquor Evaporators
- Pulp Washers • Lime Sludge Filters
- Causticizers • Digester Blow Condensers
- Surface Condensers
- Kraft Pulp Deckers

**SWENSON**

**SWENSON EVAPORATOR COMPANY**

Division of Whiting Corporation
15653 Lathrop Avenue, Harvey, Ill.
Eastern Sales Office and Export Department:
30 Church St., New York 7, N. Y.

paratus which evaporates the moisture and discharges it outdoors.

Research Corporation is a unique foundation whose net earnings, from licensing activities and the sale of Cottrell precipitators, are contributed to scientific and technical institutions and societies for the support of technical and scientific investigation and research. Niagara Blower Company, the licensee under Research Corporation patents, has been engaged in the manufacture of air engineering equipment since 1919.

▼

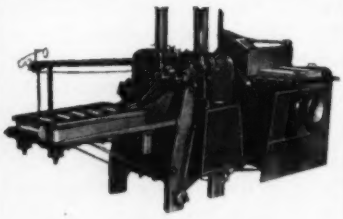
## NOPCO STARTS 3rd SESSION TECH. TRAINING SCHOOL

The third session of its Technical Training School opened at Nopco Chemical Company's main plant in Harrison, New Jersey, on October 4. Lectures and demonstrations will be given weekly for a period of seven months. The classes, conducted by the company's own technical staff, will cover many fields including papermaking, textile processing, leather tanning, insecticides, metal specialties applications, oil, and other raw material technology.

The school was originally established in 1936. Those attending are, for the most part, graduate chemists and sales trainees. Its purpose is to give the "students" a broad background in the fields approached by the company. The company feels that by having these key men completely familiar with the many manufacturing problems faced by industry, it can better serve the interests of its customers.


Lawtomatic

SEALING for AUTOMATIC SELLING



This Lawtomatic
End Sealing Machine is a honey
Its simple
Design will make you money
The cost
Is definitely a secondary issue
Because
It beautifies your Toilet Tissue
Here's another howl
It can do the same for
Your Kitchen Towel

The C. A. LAWTON COMPANY
Dept. PW DePere, Wis.

The men who have guided Harris-Seybold through company's biggest year, look through the Annual Report for fiscal year ended June 30. They are (L to R): R. V. Mitchell, board chairman; H. A. Porter, vice president in charge of sales, and George S. Dively, president. On the wall is portrait of A. F. Harris, who, while chairman of the board, passed away in June, 1943

▼

## NEW RESEARCH CENTER AT SOUTH CHARLESTON OPENED BY CARBIDE AND CARBON

One of the nation's largest and most modern industrial research centers has been completed at South Charleston, West Virginia, for the Carbide and Carbon Chemicals Corporation, New York, by the H. K. Ferguson Company, of Cleveland. Situated near Carbide's South Charleston plant, the laboratories will be the center of the company's fundamental research operations in organic chemicals and resins.

The laboratory will be used by the company to concentrate on the design of new chemical molecules with the goal of developing new "Flexol" plasticizers, new synthetic resins, and new organic chemicals for agriculture and other uses. Process development will also be carried on at the center in four large buildings to be occupied in the future.

The main laboratory building contains 69 individual laboratories, 48 offices, a large-scale laboratory, and an auditorium seating 125 persons. It is a three-story, T-shaped structure of brick and steel, 325 ft long and 96 ft deep.

One interesting feature worked out was the elimination of the possibility of cross-contamination between areas by maintaining each laboratory at a slight negative pressure with reference to offices and corridors. And another problem of the ventilating engineer—the loss of conditioned air through fume exhaust doors—was solved by providing each hood with an independent supply of clean, tempered air. When a hood is placed in operation, a lever is thrown which opens the air supply ducts and doubles the speed of the exhaust fan.

▼

## GRIFFITH RUBBER MILLS PURCHASES A BUILDING AND ADDS EQUIPMENT

To improve facilities for the manufacture of roll covering for the paper industry, the Griffith Rubber Mills of Portland, Oregon, have spent over a quarter of a million dollars on modernization of plant facilities and purchase of new equipment.

In addition to the purchase of a new building, which provides addition for the new equipment, the company has purchased several vulcanizer tubes, one of which is the largest on the Pacific Coast. A multiple drill, one of three such machines in the United States, seven hydraulic presses, a Banbery and 60-inch mill and extruding machine, also have been added.

L. R. Bigler

L. R. Bigler has been named manager of the specialty sales division, which manufactures marine products and rubber tile.

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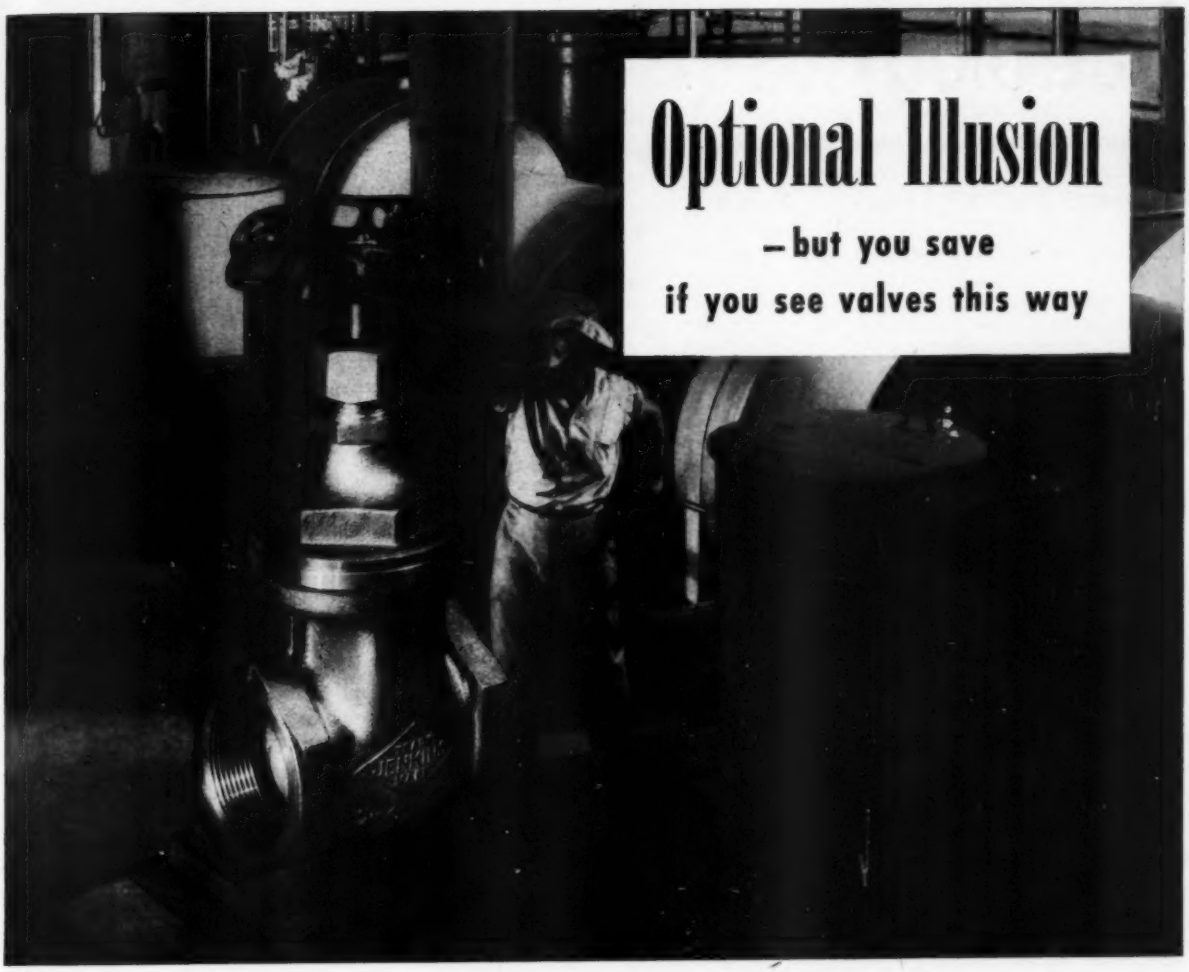
▶▶▶ OFFICES OF Chemical Linings, Inc., in Watertown, New York, were moved October 1st to 500 Trust Company Building, Watertown.

▼

## ELLIOTT CO. HAS ACQUIRED THE CROCKER-WHEELER DIV.

The business and assets of the Crocker-Wheeler division of the Joshua Hendy Corporation have been acquired by the Elliott Company, Jeannette, Pennsylvania. Located at Ampere, New Jersey, Crocker-Wheeler produces electric motors and generators; it will continue to operate as at present.

With the addition of this division, the Elliott Company will have a complete line of A-C and D-C motors and generators from one to 25,000 hp.




THERE ARE TWO WAYS of regarding the valves in your plant. You can think of the relatively small cost of a single valve, and dismiss them as a minor, "petty cash" investment. Or, you can think of *all* valves in your plant as *one* valve, as pictured, by photo-magic, in this pharmaceutical plant, — and see them in proper perspective.

YOU'LL FIND IT PAYS to take the latter view, for in *any* plant, *any* building where fluid control is involved, valves, collectively, are as important, in terms of investment and operating expense, as larger plant units, and should be selected with the same sharp eye to quality and economy.

EXCESSIVE MAINTENANCE of one inferior valve is insignificant, but multiplied by thousands, it is a serious drain on operating budgets. JENKINS BROS. helps you meet this problem two ways. First, by building extra endurance into Jenkins Valves, making them the longest-lasting, lowest-upkeep valves that money can buy. Second, with advice from Jenkins Engineers on any question of proper selection, installation, or maintenance.

For all new installations, for all replacements, rely on Jenkins quality and engineering for lowest valve costs in the long run. *Sold through leading Industrial Distributors.*

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Jenkins Bros., 80 White St., New York 13; Bridgeport, Conn.; Atlanta; Boston; Philadelphia; Chicago; San Francisco. Jenkins Bros., Ltd., Montreal.

*"PRACTICAL PIPING LAYOUTS" is a 32-page book containing diagrams and descriptions of 25 basic piping layouts with complete recommendations for valve selection and location in the lines. Tells you "which valve where for best performance". FREE on request. Write JENKINS BROS., 80 White Street, New York 13, N. Y.*

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# Necrology . . . . . .

### GEORGE M. TOWNSEND

On September 4, George M. Townsend, chief chemist and sulphite superintendent of St. Croix Paper Company, Woodland, Maine, passed away from injuries sustained when he fell from the stairway of the digester building a week before his death.

Mr. Townsend first became associated with St. Croix on a part-time basis in 1914. He served about three years in the Navy during World War I, and in 1920 returned to the plant as laboratory assistant. In 1931, he became chief chemist, succeeding Walter Brennan (deceased), and in 1939 he became sulphite superintendent, still remaining head of the laboratory.

For several months past, Mr. Townsend had been quite busy with installation of the company's new digester circulating system. It was during inspection of the new equipment that the fatal accident occurred.

▼

▶▶▶ *Robert Rankin Boyce* of Orange, New Jersey, and formerly a sales representative for the West Virginia Pulp and Paper Company, New York, passed away at his home September 12. He was 74 years old. Four years ago Mr. Boyce retired from the company after having been with them for 35 years. He was a descendant of an early colonial family, and a Princeton graduate of the class of '98. Surviving are his widow, a son and daughter.

▼

### CANADIAN PAPER MILL MEN LOSE LIVES IN PLANE CRASH

An air liner carrying 23 persons crashed near Quebec City, Canada, September 9. There were no survivors. Among the casualties were the following men connected with paper companies:

*Edward Calnan,* steam engineer in charge of power plants for the Ontario Paper Company, Thorold, Ontario, and the Quebec and North Shore Paper Company, Baie Comeau, Quebec. He had been associated with these companies for 19 years; he was supervising engineer when the mills were built.

*William B. Schoular,* paper mill development engineer for the *Chicago Tribune* subsidiaries. He had been with the Ontario Paper Company for 3½ years, having previously been connected with the Powell River Paper Company at Powell River, B.C. He was enroute to the mill in Baie Comeau at the time of the crash.

*Lionel D'Allaire,* former paper mill employee, and several relatives of paper mill families were passengers on the plane.

▼

### A. T. WALKER

The central district sales manager for Harris-Seybold Company, Cleveland, A. T. Walker, passed away September 6 in San Francisco, shortly after he arrived there to attend the International Association of Printing House Craftsmen's convention. He was 57.

Mr. Walker had been with Harris-Seybold since 1916, serving for many years as assistant to the vice president in charge of sales. He joined the company early in his career as assistant to the production engineer, transferring to the sales organization in 1921. In 1945 he was appointed sales manager of the company's central district, in charge of sales activities in Ohio, Michigan, West Virginia, Kentucky, and parts of Pennsylvania and Indiana.

A. T. Walker

He was a member of a number of local and national printing and lithographic trade associations, and was well-known in the graphic arts industry as an expert on pressroom and bindery operations.

At the time of his passing, Mr. Walker was combining his first vacation in several years with attendance at the Craftsmen's convention, accompanied by his wife and daughter.

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▶▶▶ *Jacob O. Hill,* purchasing agent for Hollingsworth & Vose Company, East Walpole, Massachusetts, passed away September 23 at his home in Wellesley Hills, Massachusetts. He was 73. Surviving are two daughters and a brother.

▼

▶▶▶ *Edward J. Johnstone,* following his recent death (Cf. P.I. AND P.W., Aug., 1949), was honored by the directors of Lockport Felt Company, Newfane, New York, who passed a special resolution in praise of the fine manner in which he had filled his place in the company, and for the contributions he had made to the paper industry. Mr. Johnstone was for eighteen years a sales engineer for the company. He was a member of the Technical Association of the Pulp and Paper Industry and of the American Chemical Society.

▼

▶▶▶ *Morley P. Wilkins,* secretary-treasurer of the United Paper Mills, Ltd., passed away at his home in Toronto, Ontario, on September 4. He was born in Galt, Ontario, and had been associated with the United Paper Mills for the past 22 years.

▼

▶▶▶ *W. Emmett Bittner,* vice president in charge of purchases of the Diamond Alkali Company, Cleveland, Ohio, passed away September 2 in Mercy Hospital, Pittsburgh. He was 52. His entire business life, since 1916, was spent with Diamond Alkali, and as a former president of the Pittsburgh Purchasing Agents Association and a member of the executive committee of the national organization was well-known in the purchasing field.

▼

### C. GEORGE LE SUEUR

The manager of the export department of Wyandotte Chemicals Corporation, Wyandotte, Michigan, C. George leSueur, passed away September 12 at Harper Hospital, Detroit. He had earned his 25-year service watch from his company shortly before.

Born in South Africa in 1898, Mr. leSueur was well known among export executives; for many years he headed Canadian sales for the Wyandotte organization, and was formerly a director of the U. S. Alkali Export Association. He had made numerous trips to every principal export market, and had contacts with leading industrialists, government officials, and manufacturers' agents in all parts of the world.

He is survived by his wife, a brother in South Africa, and his father, George F. leSueur of Johannesburg, who is a director and former general manager of the Standard Banks, Inc., of South Africa.

▼

▶▶▶ *James Logie,* retired manager of E. B. Eddy Company, Ltd.'s, Toronto, Ontario plant, passed away in his 85th year.

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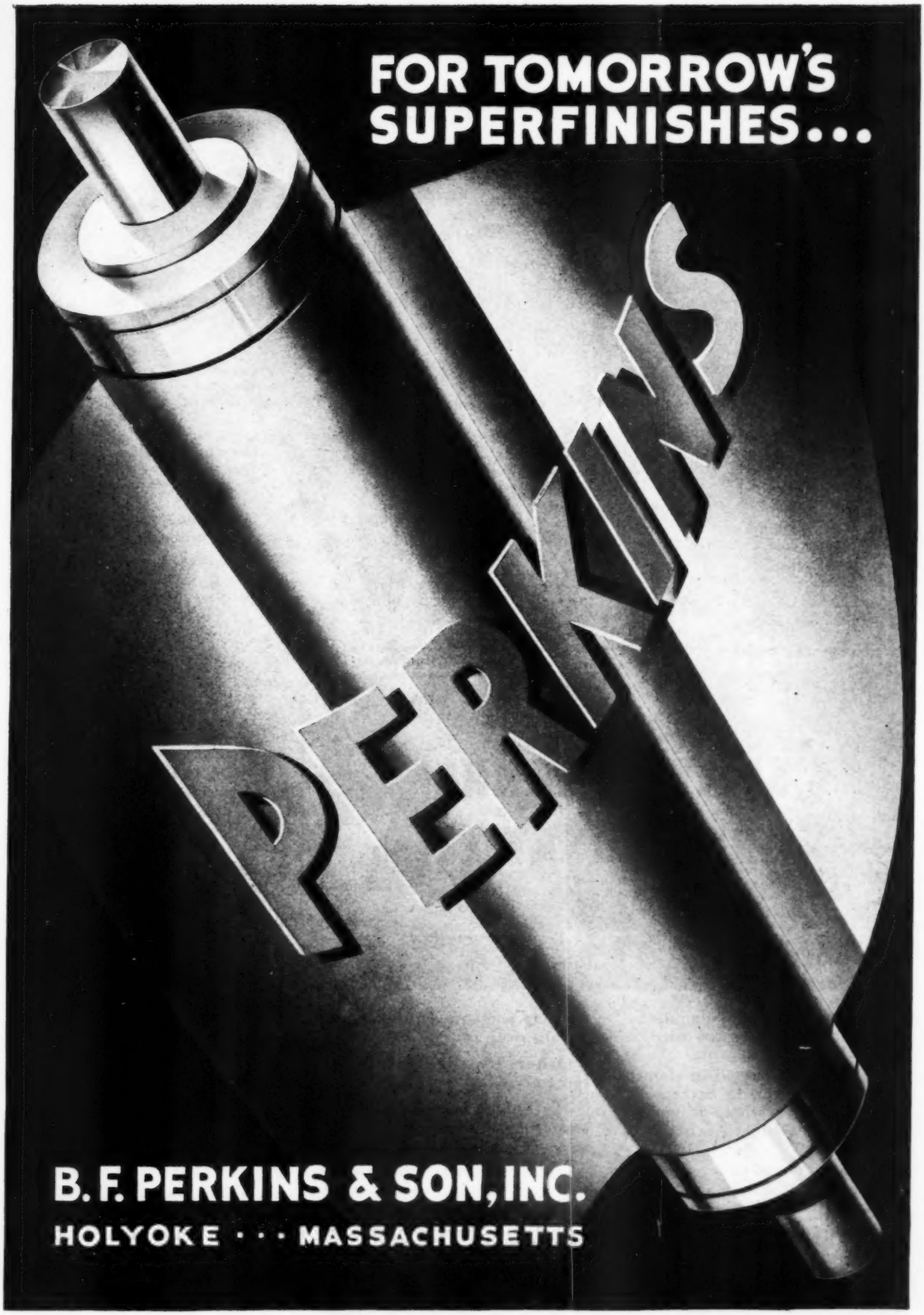
▶▶▶ *Harry J. Byrne,* executive vice president of the Michigan Carton Company, Battle Creek, Michigan, passed away August 28.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# Safety

## SAFETY SCORES FOR SEVEN MONTHS OF NEW CONTEST

▶▶▶ AWARDS IN the Paper Industry Safety Contest which closed June 30 will be presented at the luncheon of the Pulp and Paper Section on Thursday, October 27, during the Annual Congress of the National Safety Council. The contest for which these awards will be made ran for one year—July 1, 1948, to June 30, 1949.

Under a new plan announced recently (cf. P.I. and P.W. August, 1949, p. 592), all sectional contests conducted by the National Safety Council have been put on a calendar basis, running from January 1 to December 31. To start off the plan, the first six months of 1949 have become the first half of the year for contest which will end December 31, 1949. Accordingly, the following participants have completed perfect scores for seven months of the contest now under way:

### Division I—Paper and Pulp Mills

**Group A (None)**

**Group B**

National Container Corp. (Kraft Pulp Mill) Jacksonville, Fla.

West Virginia Pulp & Paper Co., Williamsburg, Pa.

**Group C**

Marathon Corp., Menominee, Mich.

National Vulcanized Fibre Co., Yorklyn, Del.

Price Bros. & Co., Ltd., Jonquiere, P.Q., Canada

National Vulcanized Fibre Co., Newark, Del.

Congoleum-Nairn, Inc., Cedarhurst, Md.

Neenah Paper Co., Neenah, Wis.

**Group D**

Certain-teed Products Corp., E. St. Louis, Ill.

Container Corp. of America, Carthage, Ind.

Crown Zellerbach Corp. (C-W Paper Div.), Lebanon, Oregon

Mead Corp., Harriman, Tenn.

Certain-teed Products Corp., Richmond, Calif.

Mead Corp. (Wheelwright Div.), North Leominster, Mass.

Armstrong Cork Co., Pensacola, Fla.

Marathon Corp., Ashland, Wis.

U. S. Gypsum Co., Oakmont, Pa.

Strathmore Paper Co. (Mill No. 1), Woronoco, Mass.

Ward Paper Co., Merrill, Wis.

Pacific Coast Paper Mills, Bellingham, Wash.

Lloyd A. Fry Roofing Co., Houston, Texas

Hollingsworth & Whitney Co., Madison, Maine

American Writing Paper Corp. (Albion Div.), Holyoke, Mass.

Lloyd A. Fry Roofing Co., Compton, Calif.

Fort Wayne Corrugated Paper Co., Vincennes, Ind.

National Gypsum Co., Newburgh, N. Y.

Riegel Paper Corp., Riegelsville, N. J.

Flintkote Co., Mt. Carmel, Ill.

Spaulding Fibre Co. (Hayes Plant), No. Rochester, N. H.

### Division II—Paper and Board Remanufacturing

**Group A (None)**

**Group B**

Marinette Paper Co., So. Glens Falls, N. Y.

Canadian Cellucotton Products Co., Ltd., Niagara Falls, Ont., Canada

Container Corp. of America, Cincinnati, Ohio

F. J. Kress Box Co., Pittsburgh, Pa.

National Container Corp. (Container Div.), Jacksonville, Fla.

Container Corp of America, Rock Island, Ill.

**Group C**

Bird & Son, Inc., Chicago, Ill.

Fibreboard Products, Inc., South Gate, Calif.

Kimberly-Clark Corp., Appleton, Wis.

Container Corp. of America, Baltimore, Md.

Bird & Son, Inc., Shreveport, La.

South West Box Co., Sand Springs, Okla.

Pillsbury Mills, Inc., Wellsburg, West Va.

Certain-teed Products Corp., Kansas City, Mo.

Thilmany Pulp & Paper Co., Kaukauna, Wis.

Fort Wayne Corrugated Paper Co., Rochester, N. Y.

Scott Paper Co., Sandusky, Ohio

Certain-teed Products Corp., Buffalo, N. Y.

ABC Corrugated Box Co., Minneapolis, Minn.

Green Bay Box Co., Green Bay, Wis.

Flintkote Co., Hollywood, Calif.

Bay West Paper Co., Green Bay, Wis.

Lloyd A. Fry Roofing Co., San Leandro, Calif.

Lloyd A. Fry Roofing Co., Robertson, Mo.

Semtile tanks have no limitations as to shape or size, provided a vertical type unit is used.

They can be erected in almost any location and in extremely confined space where it would not be possible to fabricate other types.

They withstand heavy bearing loads, as this results in a compression on the wall which aids in resisting temperature and shrinking stresses.

Other Semtile features to remember—

No through joints in a Semtile tank, either horizontally or vertically.

Semtile salt-glazed tile presents a smooth flowing, easy to clean surface.

Stebbins Engineering and Manufacturing Company

EASTERN BOULEVARD, WATERTOWN, NEW YORK

# Superior

# SURFACE COATINGS ON INSULATION BOARD . . .

## CALL FOR KELTEX

INSULATION BOARD coatings have uniform adhesive qualities and uniform surface density when you use KELTEX, the modern surface control agent. KELTEX keeps the coating on the surface and by control of selective absorption helps prevent the binder from being absorbed by the sheet faster than the pigment.

With KELTEX you also get even pigment distribution. By controlling pigment migration, KELTEX reduces any tendency toward mottling, thus giving uniform color and texture to the finished coating.

KELTEX is economical and easy to handle, soluble in hot or cold water and can be used in coatings applied from either the wet or dry end of the machine. Only a small amount is needed to give you consistently superior results.

The correct KELTEX formula for your insulation board can produce definite savings in coating costs. For details on its adaptability to your application, write to any one of our regional offices.

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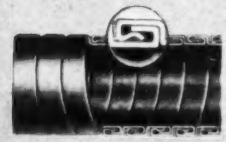
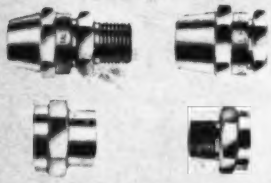
# One dependable source for every flexible metal hose requirement

Corrugated Metal Hose in steel, bronze and stainless steel.



Convoluted Metal Hose in variety of types—steel, bronze and alloys.



Couplings to meet every need.

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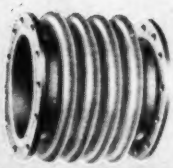
| √ | Pneumatic Hose |
| √ | Hydraulic Hose |
| √ | Chemical Hose |
| √ | Insulated Hose |
| √ | Charging Hose |
| √ | Expansion Joints |
| √ | Flexible Connections |
| √ | Exhaust Hose |
| √ | Platen Press Connections |
| √ | Tar and Asphalt Hose |
| √ | Metal Conduits |
| √ | Loading & Unloading Hose |
| √ | Gas & Air Hose |
| √ | Vacuum Hose |
| √ | General Utility Hose |
| √ | Bellows |
| √ | Flexible Lamp Arms |



Expansion Joints for high and low pressures—stainless steel and copper.

Bellows in all sizes for all requirements—stainless steel and brass.

Metal Conduits in a variety of types and materials.

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Now you can secure all your flexible metal hose needs from a single manufacturer. The handy check list above indicates only the more common types and assemblies manufactured by CMH. Other types and assemblies are also available. Bulletin 102, illustrated at the left, an application guide for CMH Flexible Metal Hose is available on request. Other literature giving full details on expansion joints, bellows and speciality items is also available. Write for your copies of the material in which you are interested and have it available for reference at all times.

## CHICAGO METAL HOSE CORPORATION

Maywood, Illinois

Plants at Maywood, Elgin and Rock Falls, Illinois

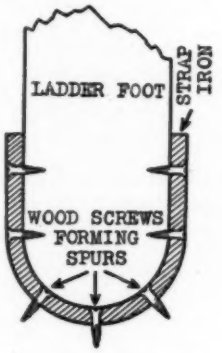
In Canada: Canadian Metal Hose Company, Ltd., Brampton, Ontario

# Practical Shorts

**Readers are invited to submit short, practical articles for this department. The items should be original and should relate to ways and means of handling production and maintenance jobs. Where possible articles should be illustrated. Rough sketches only are required. Payment will be made for acceptable items upon publication.**

## How to Prevent "Ladder Slip"

Many an accident has been caused by the slipping of the foot of a ladder. This is particularly true when the ladders are used on slippery floors.




There are various ways in which this danger can be prevented—methods for holding the ladder base rigid. A simple and excellent method, shown in the sketch, can be made by any ladder user. A piece of strap iron is formed around the bottom ends of the ladder with holes countersunk for screws, as indicated. The screws which project outward through the strap iron hold the ladder in place while those that project inward hold the straps on the ladder feet.

Do not, of course, use a ladder of this kind directly on a polished or other floor that must not be marred. Place it on a non-slip plank or old wooden board. But make certain, above all, that there will be no slip of the base of the ladder or plank or board on which it is resting.—W. F. SCHAPHORST, M.E.

▼

## Simple Device Makes Calender Stacks Safe

The Safety Threader hits at one of the most dangerous spots in the board mill. The threading of the calender stacks, which has been responsible for many accidents, has been made safe. When using this Safety Threader, it is impossible to get fingers caught in the rollers. Frequent attempts have been made in the past but the Safety Threader is the only device that has worked satisfactorily. It is used to force the sheet through the nip of the rolls. This formerly was done by hand. The gadget not only makes it safer, is also easy to use.—Adapted from *Sutherland News* (Aug. 5, 1949), Sutherland Paper Company, Kalamazoo, Michigan.

[The Safety Threader is a modification of the unit originally designed by The Champion Paper & Fibre Company, and described in Detail Sheet No. 62, published by the National Safety Council.]

## Special Machinery Drives

An interesting conversation took place between two engineers regarding the respective merits of drives on certain special machines. Engineer No. 1 stated that he had never before favored any particular drive for the machine because, as he said, "I had given the matter practically no thought." But after the above conversation with Engineer No. 2 he states that he now finds himself an ardent chain drive "fan," and he gives the following reasons which he thinks will probably be of interest to other readers:

Like gears, chains provide a positive and unvarying ratio. They make it possible to regulate accurately the speed of the conveyors and agitators in pipes. But unlike gears they are not so stiff and unyielding. Chain drive lends itself ideally to this particular machine setup.

Most readers doubtless know that the efficiency of a first class chain drive is high. But it is not so well known that even the less expensive types, the heavy link belts, such as used on some machines, have a higher efficiency—surprisingly high. In fact, the efficiency of these drives is usually so close to 100% that the power loss is of no consequence whatever. Anyway, efficiency of transmission is usually of less importance than dependability.

The first cost of link belt chain drive is moderate. In the final cost must be reckoned the freedom from "dead" machine time, the lower interest on the smaller investment, the simplicity of installation, and the low maintenance cost.

Chain drives have great strength and durability. They do not wedge or bind. Slight sprocket misalignments have no noticeable effect on performance, efficiency, or life. These latter points are of greatest importance on certain special machines, as most users will doubtless agree. A drive that is as rugged and dependable as the chain drive, and at the same time is so efficient, is bound to be truly economical in the long run.—W. F. SCHAPHORST, M.E.


## One of the Men behind Eastwood Wires

James Dorney

### Whose work is always "on the beam"

**The spools of wire you see in the background are being wound onto the back beam of a loom. Every single wire from the 60 or more spools (depending on the size of the mesh) must be guided into an exact place of its own on the beam. Only a one-inch section of the beam can be filled at a time. After this back beam is filled, each warp wire must be threaded through guides leading to the front of the loom, where the actual weaving takes place. This is one more of the many painstaking operations in the manufacture of quality fourdrinier wires.**

**EASTWOOD-NEALLEY CORPORATION • Belleville, N. J.**

# International Review.....

*News from Other Countries . . Technical Developments Adapted from Foreign Literature*

## Oji Paper Combine Broken

▶▶▶ THE LARGE AND powerful Oji Paper Manufacturing Company, Ltd. (Main office in Tokyo, Japan) has been broken up through postwar changes brought about principally by General MacArthur's anti-monopoly directive. This 81-year-old company had expanded and progressed through decades of amalgamation and consolidation. A complete digest of this company's mills, equipment, and production appeared in the August 11 issue of *The World's Paper Trade Review*. The following is abridged from that article:

▶ Many of the Japanese industrial combines which had been earmarked for dismemberment soon after the occupation, remained intact because technological integration in the interest of higher efficiency and lower cost was permitted by SCAP to continue. In fact, many small and inefficient firms were recently compelled to combine with larger rivals at the sacrifice of their corporate individuality. But for the paper industry no such technological case could be made.

Even though Oji Paper had lost half its mill capacity in World War II, either through territorial annexation or through bomb damage, the remaining capacity was thought to be too large to remain under a single tight control.

Three separate firms with widely diffused ownership were set up, each of them still powerful and, it is believed, individually as efficient as the combined setup:

1—The Tomakomai Paper Manufacturing Company, with mill at Tomakomai.

2—The Tosuji Paper Manufacturing Company with mills at Kushiro, Kokura, Yatsushiro, Sakamoto, Tosuji, Fushigi and Toshima.

3—The Honshu Paper Manufacturing Company with mills at Fuji, Kishibuchi, Nakatsu, Edogawa, Yodogawa, Kumano, and a chemical plant at Nagoya.

The Tomakomai mills have 10 paper machines with a monthly capacity of 27,690,000 lb. There are six sulphite pulp machines and 54 ground-pulp machines with monthly capacities of 5,252,000 lb and 26,000,000 lb respectively.

The Tosuji mill has 26 paper machines with a rated monthly production of 24,752,000 lb. There are four sulphite machines with a combined capacity of 3,479,000 lb and seven grinders with an aggregate capacity of 3,276,000 lb.

Honshu has 21 paper machines rating in all 13,286,000 lb a month. The pulp is supplied by five sulphite installations with a monthly capacity of 1,950,000 lb and two grinders capable of producing 10,681,000 lb of newsprint pulp a month.

Thus the Oji combine, before it broke up, had 57 paper machines with a monthly capacity of 65,728,000 lb, fifteen sulphite pulp plants with a monthly capacity of 10,681,000 lb, and 72 grinders with a monthly capacity of 34,114,000 lb.

Through the loss of its Saghalien mills to Russia, and through bomb damage in the 1942-45 air raids, Oji Paper lost about half its annual prewar papermaking capacity of 1,575,000,000 lb. The loss in sulphite pulp capacity was proportionately even higher. The Kushiro mill was damaged by fire last year, but has been largely rehabilitated.

There were, and still are, eight smaller papermaking concerns, but in 1939 they accounted for only 20.08 per cent of all Japanese paper production. Their share in the market has since remained about the same.

Among the outsiders, the Hokuetsu Paper Manufacturing Company still retains its dominant place. In 1938 it accounted for 4.11 per cent of Japanese production. Monthly production of newsprint runs to 4,000,000 lb. The firm has a cardboard mill with a monthly production of 500 tons. The other three of its five plants produce rayon pulp and fiber board. The firm operates a small lignite mine with a monthly production of 1,500 tons.

▼

## Research Work in Wood Technology in Finland

On the occasion of the 3rd World Forestry Congress, the research work of various laboratories and institutes in Finland is reviewed in a well illustrated article. The *Finland Institute of Technology* has a section on Wood Chemistry under the direction of Prof. R. H. Roschier, and a paper laboratory under the guidance of Professor H. Pellinen. *The Institute of Wood Chemistry* at Abo Academi gives a brief course in pulp and papermaking. Investigations on silver birch wood and bark have been undertaken, and a large number of masters degrees and a few doctorates have been granted by this academy.

The *Wood Technical Laboratory of the State Institute for Technical Research* has six sections, four of which are under state subsidy while the other two have been supported temporarily (in part) by industry. There is a machine hall, saw mill, dry kiln, a wood preservation section, etc. The *"O. Y. Keskuslaboratorio-Centrallaboratorium A. B."* is a research institute of the Finnish industry at Helsinki, privately owned and organized as a limited company. It has experimental pulping equipment, rayon pilot plant, an industrial organic department, a pulp bleaching plant, pulp testing laboratories, etc. The managing director is Dr. Bertil Nybergh, who is assisted by Drs. Gustafsson and Sihtola, and by Engineer Jaakko Murto.

This Institute is in very close touch with industry, 13 committees of which follow the researches of the Institute and draw up its program. The Institute, however, also keeps in touch with the universities and takes on a number of graduate students. Anon. *The Finnish Paper and Timber J.* 31, No. 12, 201-11 (1949) (In English).

▼

## Proposed Integrated Pulp and Paper Mill, Portugal

The following very important announcement was made in the September 19, 1949, issue of *Foreign Commerce Weekly:*

Plans have been drawn by a group of Portuguese capitalists for an integrated mill to manufacture annually, in the beginning, 20,000 metric tons (1 metric ton=2,204.6 pounds) of sulphite pulp (10,000 tons, bleached), and 18,000 tons of paper. The design of the mill will permit doubling the pulp capacity, while maintaining the same ratio of bleached pulp to total pulp, and increasing the paper capacity to 28,000 tons annually, with a minimum of expense. If present plans are carried out, the mill (in conjunction with a sulphite-pulp mill now producing 6,000 tons of pulp annually) ultimately will supply Portugal's entire requirements for kraft paper and bag paper, and most of its requirements for fine paper, and will still have from 30 to 50 percent of its pulp capacity left to supply the export market. The promoters of the company believe that markets can be developed in Europe, principally the United Kingdom, for this amount of wood pulp. In 1948, Portuguese exports of pulp reached 2,420 tons, of which 500 went to Belgium-Luxembourg, 650 tons to France, and 1,270 tons to the United Kingdom.

The proposed mill will be located at Cacia, near Aveiro, some 60 kilometers south of Oporto in a heavily wooded region which it is calculated will supply continuing pulpwood requirements on a sustained yield basis and give local timber owners a more profitable outlet for their products. Laboratory tests in the United Kingdom and mill scale tests made in Finland are reported to have shown that Portuguese maritime pine has papermaking values between those of the United States southern pine and the Scandinavian pines. The proposed mill would employ approximately 1,000 workmen in three shifts and several hundreds more in wood operations.

The cost of the sulphite mill, machinery and equipment, coal-burning power plant, and repair shop is estimated at approximately $6,000,000, and that of the buildings at about $2,000,000. To this must be added

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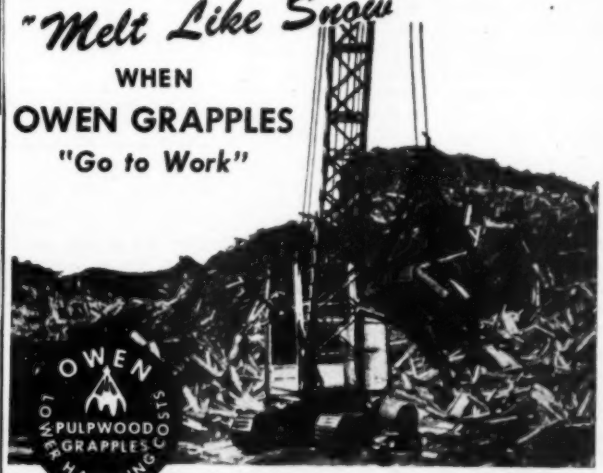


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construction and installation costs of about $700,000, or a total approximating $9,000,000. Local capital is expected to put up nearly $3,900,000 to cover the cost of the buildings, construction, and installations, and to supply working capital. The promoters hope to obtain a loan from some foreign governmental or intergovernmental agency, of approximately $6,000,000 to buy machinery and equipment, a considerable part of which must be paid for in dollars. If financing arrangements were completed so that construction could begin when planned, the mill should be able to begin operations sometime during the latter half of 1951.

▼

## British Paper Notes

**(August, 1949)**

▶▶▶ In prewar days, August, in the paper trade, was generally accepted as a "dead" month, as annual vacations at mills and elsewhere resulted in a slowing down of trade. The present August has certainly reverted to prewar as far as the British paper trade is concerned. The present slackness is undoubtedly partially due to this feature, but whether business will revive in the early days of September is questionable. Nobody appears confident enough to make any predictions with regard to the immediate future, and although it is understood that prospects for the autumn in the paper trade of America are promising, there are no signs here of any upward swing. It is still believed that large stocks are held at merchants and consumers, and the general experience of the former is that day to day purchases are not dipping heavily into these stocks, although eventually these orders will have their cumulative effect.

Paper purchasers are still complaining of high prices, although these complaints are based mainly upon the known prices paid by the government for their bulk purchases of pulp, and the cost to the consumer of the manufactured paper. The latest person to stress this fact is Sir Frank Newnes, chairman of the large periodical publishing house of George Newnes Ltd., who considers that prices of paper should be substantially reduced, as these continued high prices tend to discourage publishing houses from venturing in the direction they desire.

Further confirmation of the present slackening position is the news, just published, that the old established mill at Polton, Midlothian, Scotland, owned by Annandale and Son, Ltd., is to close this month owing to lack of orders. This mill is over two centuries old, is a member of the Wiggins, Teape group, and produces high quality rag tub-sized ledgers and other writing papers. Another leading British mill, for the same reason, lack of orders, combined with the Control's continued restrictions on usage, has had to introduce short-time working. Concurrently producers of pulp in Sweden are curtailing production in an effort to avoid overstocking.

A further slight increase in paper consumption may operate from the beginning of next month, as a result of a new order from the Board of Trade, which has increased the consumption of paper from two to five cwt during each three months period to certain advertisers. This announcement, however, has aroused but little interest, for it is generally felt that with an abundance of paper available, and sales of practically everything declining, such irritating restrictions on the movement of trade should be abolished altogether.

There is little doubt that the cessation of the Paper Control is long overdue, and resentment against prolongation of the Control is growing, both as regards the purchasing of papermaking materials and the complete freedom in the sale of paper. Everybody in the trade readily acknowledges the excellent work which has been accomplished by the Control during the past decade, but its usefulness no longer operates.

This feeling is understandable with the trade in its present state and the Board of Trade monthly returns, which are published for general reading. The latest returns show that over a million tons of materials have entered this country during the first seven months of this year, not far short of the prewar rate. These imports, added to record collections of wastepaper and the increased use of home materials, particularly straw, must place the material supply position practically equal to prewar, if not beyond it, and there would appear to be every probability of paper production equalling 1939, if all restrictions were removed. The cheapest quality of wastepaper, incidentally, is in such supply that some of the local councils are discontinuing its collection, as they are finding it increasingly difficult to dispose of this waste.

▼

## Australian News

*Associated Pulp and Paper Mills Ltd.* This company is now manufacturing woodfree printing and writing papers from imported Scandinavian pulp at Bernie, Tasmania.

In a statement to the trade the company says: "We feel that an explanation is due to the printing trade as to our reasons for undertaking to manufacture these qualities from imported pulp. At the present moment, we have at our mill a surplus of paper machine capacity, and it now seems clear that this surplus will continue for some time. We, therefore, have decided that rather than have a valuable paper machine idle for part of the time, we shall increase our production by the use of imported pulp.

"We desire to make it clear that the step we have taken in no way prejudices the supply of our standard qualities to the printing industry throughout Australia. If we did not take this step, printers would not get more standard Burnie paper than they are at present receiving, or earlier deliveries of it."

*New Zealand Forest Products Ltd.* This company has ordered £500,000 (about $1,500,000) worth of equipment for its projected kraft pulp mill near Kinleith, near Putsruru. The mill, the first of its kind in New Zealand, is expected to commence production at the end of 1951. The plant is being supplied by the United Kingdom, Australia, Sweden, and Finland. The mill and auxiliary operations will cost £2,000,000 sterling (approx. $7,500,000). The company will supply at least 12,500 tons of pulp yearly to Australian Newsprint Mills, Ltd., for 20 years.

*Newsprint News.* Australian consumption of newsprint in 1950 is estimated at 160,000 tons, 30,000 tons of which will come from Tasmania. Orders placed so far are 65,000 tons from the United Kingdom, 25,000 tons from Scandinavia, and 5,000 tons from Canada. This leaves 35,000 tons to be procured elsewhere. Among other newsprint offering in Australia is Polish at £35 sterling, but so far no orders have been placed with Polish firms.

# Foreign Abstracts . . . . . .

## Printing Inks for Food Wraps

The reciprocal action between the contents of a package and the printing ink used on its wrapper may manifest itself in one of several ways. The contents may react with the ink; inks affected in this way may then attack the packaged contents. In rarer cases the original ink without subsequent change may itself attack the contents of the package. Naturally, it is practically impossible to prepare an all-service ink which will be resistant under every condition of use. The destructive action of fats and greases (some of which also contain preservatives), the volatile oils (especially from packaged spices), cheese, warm bread, chemicals, pharmaceuticals, bleaching agents, candies, tobacco, dyed fabrics, and some of the newer plastics (*e.g.* rubber heels) all may affect the initial printing ink. Butter and similar food stuffs may then themselves be attacked by the affected inks, and it is essential that toxic ingredients be absent from the original ink.

The rare cases in which the original ink affects the package material is manifested at times in packaging films, and it is essential that such inks be photochemically inert. Thus it is important that the printer and the purchaser co-operate, so as to protect themselves and each other; the printer being kept fully apprised of contents to be packaged, and in turn supplying printed wrappers to the prospective purchaser for preliminary experiments.

In general, letterpress printing gives the best results; the aniline process from rubber plates is also suitable. It is essential that the ink on the wrap be thoroughly dry. In extreme cases, the best solution is to use an impermeable sheet as a first wrap and to print only on the outer wrapper. Hamadr. *Allgemeine Papier-Rundschau* No. 2, 64-6 (May 15, 1949) (In German).

## Logging and Storage Decay

The Swedish researches on blue stain and on the decay of logs before and during floating (undertaken at the request of the Svenska Cellulosa A.B.) are reviewed. Barked logs are susceptible to marked decay both before and after floating, and their commercial value may be reduced by as much as 9%. When the logs are not barked prior

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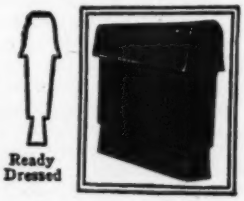

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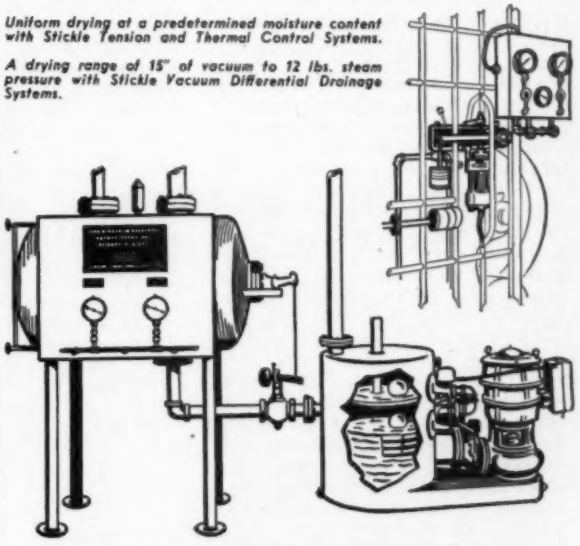

● Stickle Bulletin No. 160, "Stickle Steam Systems for Paper and Paper Board Mills," and auxiliary Bulletin No. 160-A, give information and data on Stickle Equipment, in use in paper and board mills throughout the States and Canada, providing manufacturers the advantages of increased production, improved product quality, and reduced operating costs. Mailed on request.

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to floating, decay can be avoided very largely, but such logs have the tendency to sink. Partial barking has been resorted to, in which patches of about 20% of the bark has been removed so as to leave an unbroken bark belt between such patches. This type of barking is applicable to conditions in Finland, but legislation prevents floating of unbarked wood, which it is assumed (unjustifiably) impairs fish life. The author suggests that such laws be modified to permit floating partially barked wood, the barking operations on which could then be carried to completion on barking drums in the mill. O. V. Luostarinen. *Finnish Paper Timber J.* 28, No. 24, 384-8 (Dec. 31, 1946) (Original in Finnish with English summary).

## "Gammexane" and the Durability of Paper

For the preservation of library and office records against insect attack, "gammexane" (produced by Imperial Chemical Industries, Ltd.) has been recommended. No. 2 gammexane smoke generators were used, and provided a concentration of 2 oz. per thousand cu. ft. Paper samples were exposed to this smoke for 72 hrs., care being exercised to prevent scorching. Exposed samples were later subjected to accelerated aging by heating 3 days at 100 degrees, and tensile and folding endurance were then measured by the TAPPI method. Exposure alone to the gammexane smoke caused a substantial reduction in both tensile strength and folding endurance (as much as 53.7% and 71.5% respectively in one case). When papers that had been exposed to the smoke were then "aged," they turned slightly yellow and in most cases lost their folding endurance completely. An excellent handmade paper with a folding endurance of over 4000 had this property reduced to 28.5% of its initial value after exposure to the smoke and to zero, after accelerated aging. The data indicate that exposure to gammexane is injurious to paper records. S. Chakravorti, *Nature 163*, No. 4146, 607-8 (1949).

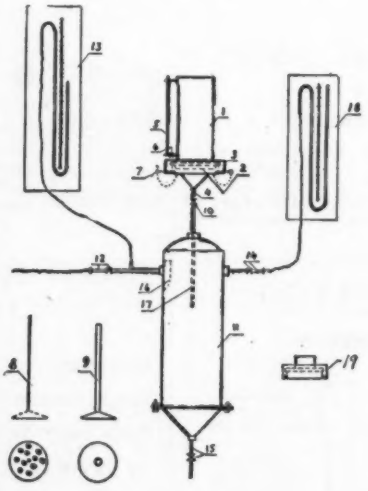
## Testing Pulp Quality by Means of a New Test Sheet Machine

Recognizing the difficulties in correlating pulp quality and strength actually occurring during the operation of a paper machine with those of sheets formed on the ordinary laboratory sheet-machine, the author has constructed a new sheet-making apparatus which had been in successful operation for six months, in the Myllikoski mill in Finland, when his article was written (i.e. March, 1949). In his opinion, the new apparatus and techniques serve in giving a better evaluation of pulp quality than do sheets formed on ordinary sheet machines. A diagram of the equipment is shown in the accompanying figure. Finnish and Swedish patent applications have been made.

The machine has a filtering and sheet forming device including a wire cloth (2) over which is the filtering cylinder (1) with packing (3), a water gage (5) and a lower drainage tank (11) which is connected through valve (10) by means of the funneling device (4). (11) may be connected with a vacuum line (12) or pressure line (14). Furthermore the instrument includes two protective plates, (8) which is perforated and (9) which is solid; these serve to prevent breakage in the sheet when it contacts liquid. A separate piece (19) serves to retail the fiber sheet; it has an opening, and may be substituted for (1) when wet strength is to be determined. A mercury manometer (13) records the vacuum; a pressure meter (18) serves to record pressures during the various tests.

By means of this equipment it is possible to determine (without disturbing the position of the fiber sheet in the filter), time required for "filtration," water-drainage, air-permeability, and bursting strength of the wet sheet. The fiber content of a suspension used need not be known in advance, it may be determined later by the use of suitable graphs given by the author.

The various tests require a total period of about 20 minutes, and are supplemented by use of a Mullen tester. The so-called "fineness determinations" include (S), the drainage time in seconds during the formation of the initial sheet. The vacuum in this test is maintained at 50 mm mercury and 1 liter of the suspension is used (with a consistency of 0.08-0.15%). Directly thereafter the white water is returned to cylinder (1), so that all the fibers originally present are finally retained on (2). Thereafter the drainage time *with pure water* is determined at 20 degrees C. and a vacuum of 200 mg mercury. This time is recorded as (H). Directly thereafter, the air permeability in seconds (V) is recorded. According to the author, this is the time required for reducing the vacuum in the lower cylinder from 30 to 10 cm mercury. (This is not completely explained in the English summary). The first bursting strength test (M) is made with the wet sheet (retaining 85% water) and in position on the sheet machine. The technique here is not fully described in the English summary. Thereafter the sheet is pressed to 50% moisture, and a



Mullen test is made (N). Thereafter the sheet is dried (to 8% moisture) and another Mullen test (P) is carried out (M, N, and P are in square meters; H, S, and V are seconds). The author then gives an empirical equation, in which the general term (Y) represents the suitability of the fibrous material (either mechanical pulp or beaten paper stock) for papermaking. This equation (which is not given consistently in the English and Finnish portions of the article) appears to be:

$$Y = \frac{80\sqrt{10\ (1 + \log PMB)}}{3 + \log\left[(HSV/1000)^2 - (HSV/25) + 600\right]}$$

In mill control work, the operator at the grinder should be able to get three relevant numerical values, i.e. (P.M.V), (H.S.V) and Y, thus with experience obtaining a distinct picture of the freeness, strength, and general suitability of the mechanical pulp for papermaking purposes. Pekka Vuorisalo. *Finnish Paper Timber J.* 31, No. 5, 77-82, No. 6, 96-9 (1949). (Original in Finnish with a brief English summary.)

## Combating Microorganisms in Pulp and Paper Mills

A review is given of sources of infection and of the growth of microörganisms in the mills. The sterilizing action of high temperatures aids in slime control, and the author points out the steps which can be taken in the mill for reducing contamination. These include general "good housekeeping," water chlorination, disinfection of the white water system, etc. There is a discussion of the effects of various disinfectants. The superiority of organomercurials is stressed, and studies were made of the retention of mercury in the fibers. The author isolated pure cultures of the *"Desulphovibrio"* bacteria from a paper machine system. These microörganisms are unique in that in their metabolism they produce hydrogen sulphide, in the presence of which the mercurial disinfectants are decomposed and their effects are "neutralized" because mercuric sulphide is precipitated. Methods for controlling and determining effective (and economical) doses of the disinfectants are discussed briefly. Stig O. Pehrson. *Svensk Papperstidn.* 52, No. 9, 217-20 (May 15, 1949). (Original in Swedish, with an English summary).

## Influence of Chip Thickness on Pulp Yield and Quality

Experiments were made with chips at the A.B. Central laboratorium at Helsingfors. Northern spruce wood was used in the sulphite cooks and northern pine for the kraft cooks. The chips were cut by hand into rectangular parallelopipedons, 35 mm long and 25 mm wide, whereas the thickness varied from 0.5 to 7.0 mm in the sulphate cooks and 0.5 to 5.0 mm in the case of the sulphite digestions. In other words the variable was chip thickness. Cooking to three different degrees of delignification was made possible by varying the cooking period in the sulphite digestions and the temperatures in the kraft cooks.

The reliability of this technique was tested by using spruce with wide and with narrow annual rings and pine sapwood and heartwood. The results all indicate that pulp yields and papermaking properties are correlated with chip thickness, a decided maximum occurring at about 3 mm. Very thin chips gave very poor results all in all. Strength properties vary directly with chip thickness; the tearing strength of sulphate pulp being an exception, a point requiring

*(Turn to page 860)*

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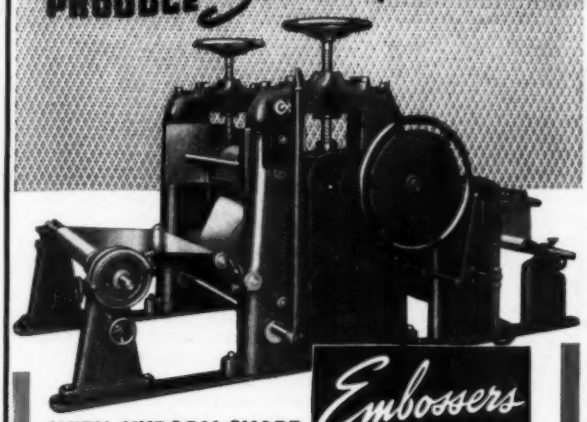

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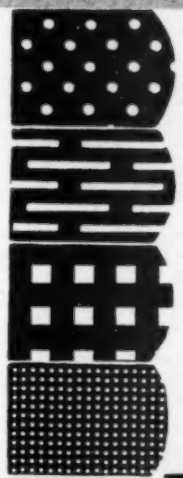

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# Tree-Planting Tips . . . . .
# As Given by an Expert

**ELWOOD WILSON**[1]

▶▶▶ PLANTING TREES is lots of fun and profitable, in the long run. It is easier than running a vegetable or flower garden and you can raise your own shade trees, ornamental and hedge plants, at a very small fraction of what it would cost you to buy them from a commercial nursery. In a bed 3 x 4 ft you can raise 480 deciduous or 960 evergreen seedlings.

The seedbed should be made of good sandy loam with a mixture of well-rotted stable manure and should be raised about four inches above the general soil level. You can put a frame of half inch boards around it, if you like. Broadcast the seeds evenly and not too thickly over the bed and put on just enough earth, which has been sieved through a quarter inch mesh, to cover the seeds. Firm this down and cover with sphagnum moss or clean straw. Water and put a shade frame of lath, like the snow screens which are used on the roads in winter, about 18 inches high on the north side of the bed and about a foot high on the south side. As soon as the seeds begin to sprout carefully remove the moss or straw. The little trees should be watered with a spray whenever they become too dry and the shade frames left on till early August. Then till the end of the second year they need only water and weeding.

At the end of the second season, they should be carefully lifted and planted in rows 9 inches apart, one and one-half inches apart in the rows. Great care should be taken to prevent drying out by sun or wind.

### Discard Poor Trees

At the end of the first or second year in the transplant bed, depending on the species and size, they should be planted in a permanent location. It is a good plan to discard the poorest ones. The roots must be kept moist on the way to the planting site and up to the moment they are planted. The best method of planting is to make a deep hole and large enough to take the roots without bunching or bending and they should not be flattened out at the side of the hole and in NO case should they be planted deeper than they were in the transplant bed. This is the cause of the greatest mortality and its effects may not appear for several years. Fill the hole with earth and press down firmly with the foot. If the planting site is covered with sod it may be removed when making the hole. If only a small number of trees are planted, light watering for the first week will help. It pays to plant carefully for every tree that dies makes the surviving ones more expensive and there is no sense in planting unless the trees live. There should be 95 per cent survival.

### Planting Machines

Planting machines have been developed for large scale work. They will plant up to 15,000 trees per day and the results are said to be as good as hand planting. They are tractor-drawn and cost from $300 to $750.

Spring is the best time to plant, as soon as the frost is out of the ground.

Spruce should be planted 5 x 5 ft each way, 1742 per acre, white pine 6 x 6, 1210 per acre, red pine 8 x 8, 681 per acre, maple and other deciduous trees 10 x 10, 436 per acre. The spruces can be planted close and thinned out for Christmas trees.

### Good Investment

Anyone who has a piece of land too poor or too steep to plant crops on should plant it with trees. He would begin to get returns in about 25 years and from then on would get a continuous revenue. There is no better or safer investment. Try it and see.

(*) From the September, 1949, issue of *Woodland World*. Reprinted with full permission of the publisher, Canadian Forestry Association.

(1) Recognized as one of Canada's best known foresters. It is stated that he has been responsible for the planting of over 40 million trees.

A. G. P. Stephen, headmaster of Toronto's Upper Canada College (L), and S. J. Totten, school master, show four of their students correct way to get young tree off to a good start

Man planting two-year-old Douglas fir on logged and burned land. Constant, intensive program of reforestation is carried out by the B. C. Forest Service

*(Continued from page 858)*

further study. Chips made with a commercial chipper usually gave results lower than those obtained with laboratory handmade chips. The reason for this appears to be that the mill chips averaged less than 3 mm in thickness.

Characteristics of mill chippers can be tested by comparing pulps obtained (under identical conditions) from mill chips and comparing them with pulps made from handmade chips (cut to 3 mm thickness). The article includes 2 tables and 23 diagrams. Albert Backman. *Finnish Paper Timber J.* 28, No. 13, 200-8 (July 15, 1946) (Original in Swedish with English summary).

## Sulphate Digestions in the Presence of Elementary Sulphur

By gradually increasing the amounts of elementary sulphur added to a sulphate cook, pulp yields could be increased by as much as 20%. Six series of such experimental cooks were made, and in all instances an increase in yield was noted when native sulphur was incorporated into the cooking liquors. In most cases, the per cent of lignin in the pulp did not increase very markedly (and in a few instances a slight decrease was actually noted). The pulps also showed no great differences in pentosan content. In general with a reduction in cooking temperature the pulp yields increased. 16 references. Tauno Kurenniemi and Jaakko O. Murto. *Finnish Paper and Timber J.* 30, No. 24, 437-444 (1948). (In Finnish, with a brief English summary)

# GET ACCURATE BULKING OR THICKNESS CALIPER WITH CADY EXACT MICROMETERS

Left: Standard (spring action) Micrometer; Right: Dead Weight (Gravity type) Micrometer

Cady horizontal dial micrometers are built to precise specifications, and are in use throughout the industry as desk models as well as on the production line. Many are being used for continuous calipering where operations favor this type of measurement. The dials are glass covered, 6" diameter, and are calibrated for easy, exact reading in 1/1000ths or half-thousandths of an inch. The models shown above have 4" throats, but the Standard (left) micrometer is also available with 7, 12, or 18" throats. Standard model calipers sheets up to 5/16" thick; Dead Weight model up to ½" thick. We also manufacture a Corrugated Liner Micrometer for calipering flute thickness of boards. All models available for early delivery. For paper makers, users, fabricators, the Cady Tester makes the "Cady" or Mullen Bursting Strength Test. Cady Basis Weight Scales show weight in lbs. per sheet count for papers and tissues; Boxboard Scale shows number of sheets per 50 lb. bundle.

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# Convention Papers . . . Abridged

## G-E Paper Industry Electrical Conference*

### Less Work for the Operator Means More Production

**G. E. SHAAD**
**Paper and Textile Division**
**General Electric Company**

While automatic process control has been continually improved and new techniques bring us closer to the theoretical automatic mill, it is not yet possible to throw in logs at one end and come out with shipping rolls at the other. The human element is still necessary to the production of quality paper.

In some cases their work is purely manual, but in many cases their important work is adjustment and control of the many variables involved, and their judgment and knowledge are the basis for continued quality production. If then, these men (on whom the mill production depends) are handicapped or are delayed in their control of these variables by the need for performing manual work or by lack of instrumentation to show that changes have been made, then they cannot perform their main duties as completely or as efficiently.

To eliminate this lost efficiency entirely is not practical, but many steps in the right direction can be taken at relatively low cost and high return. These steps may range from the installation of automatic temperature control of dryers, or automatic head box level control or automatic jordan load control to such simple and inexpensive items as process metering, or relocation of operators control stations or color coding and tagging of wiring to minimize maintenance downtime.

Surprisingly enough, even the simple things can amount to a substantial amount of money in a year's operation. Assume, for example, a poorly located operators panel on the calender section of a machine causing an average delay of 5 seconds in rethreading the stack as a result of poor location. At an average of two breaks per day there is nearly an hour's lost time or about $1,000 lost production per year. An insignificant amount of lost time per day, but an appreciable amount of time lost in a year's operation.

Or perhaps a remotely-located, manually-controlled valve may indirectly cause 5 minutes a month in lost time, again nearly $1,000 a year. In some cases such a situation may not involve a loss of production, but the inconvenience and physical labor involved may be the background for demanding higher wages. Motor operated valves and remote position indicators would eliminate such a situation.

In addition, such remote operation permits protective interlocking that in an actual case would have prevented an operator from opening the 150 lb steam valve into a digester without closing the 50 lb steam valve feeding the same digester. Naturally the higher pressure forced half cooked chips and black liquor throughout the entire 50 lb header system, including the dryers on the paper machine and shut down the entire mill. It happened only once in the 10 years of operation, but over 3 days were required to clean out the system and get the mill back into production.

The possible time and production savings from automatic control of various functions are sizable and should be investigated. Unfortunately, a common thought on automatic control is that of the completely automatic control system that eliminated ten operators but required a standby maintenance crew of twelve men to keep the machine in operation. It is true that additional maintenance will be required on automatic systems. It may require additional maintenance personnel and facilities, but against this must be counted not only the increased tonnage to be expected, but also the intangible benefits of improved quality control. In some cases it will not be economical, in others it will pay large dividends.

### Higher Mill Efficiencies and the Gas Turbine

**W. C. BLOOMQUIST**
**Industrial Engineering Division**
**General Electric Company**

Cost of steam and power for paper mills ranges from 10 to 20 per cent of the *cost* of the product—a good average is around 15 per cent. Even though this 15 per cent is a small part of the total, the mill fixed expenses are high so even a few per cent saving in fuel and power exerts a leverage action on the net earnings of a company.

With the exception of hydro mills, we can think of this 15 per cent cost as fuel and that is the easiest to translate into dollars.

It is not only important that the mill operation be in balance—heat balance as we engineers call it—but also that the mill fuel rate be the lowest.

What can mills do to reduce this controllable expense—fuel? A few things are:

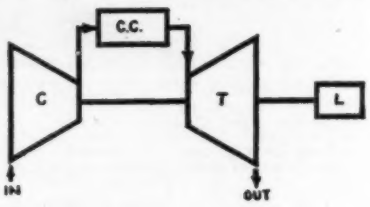
1. Recovery of waste heat.
2. Selection of higher pressures and temperatures for steam turbine generators.
3. Use of topping and extraction steam turbines when applicable. It is not unusual to get 20-40 per cent more kilowatts for the same plant steam requirements.
4. Proper selection of equipment such as mechanical vs electrical drives; gas turbine vs steam turbine.
5. In some mills it may be cheaper to purchase some power than generate all.

Around the turn of the century a Frenchman built a fairly good size gas turbine along present lines, but it was not practical as all of the power developed by the turbine was required to drive the compressor. In present gas turbines about ⅔ of the power is required for the compressor and ⅓ net is available for the load.

During the intervening years, the efficiency of both compressors and turbines were increased and with the introduction of high temperature materials the gas turbine became practical. All major turbine manufacturers in this country have designed or are building gas turbines.

There are two types of gas turbines. One the "flow" type—your steam turbine is of this type and is really a gas turbine since steam is a gas. The other type—and what we generally think of when we speak of a gas turbine—is the so-called "combustion" type.

Figure 1 is a schematic diagram of a simple gas turbine cycle. Air is compressed in the compressor to about 75 lb and then passes into the combustion chamber where fuel is injected and burned. The hot gases then expand through the turbine doing work.




SCHEMATIC DIAGRAM
SIMPLE GAS TURBINE CYCLE

Figure 1

Hot exhaust gases from the turbine contain a lot of heat which can be used to produce steam in a boiler, used directly for drying, etc. or, as in the case of the gas turbine power plant, to heat the compressed air and thereby reduce the fuel consumption.

The general applications of gas turbines are similar to steam turbines, depending upon the type of unit; that is, for power generation only, or for power generation plus process heat.

**Example No. 1**

(Paper mill—power and process steam)

The simplified diagram, Figure 2, shows only the basic features. The turbine is of the simple type utilizing the heat of the exhaust gases to produce steam in two boilers at two different pressures—175 psi and 40 psi. From the last boiler the gas goes through an economizer to heat the feed water for the boilers and then the gas goes up the stack.

The over-all thermal efficiency of the steam and power production—a measure of the fuel dollars—is about 72 per cent. Maximum possible efficiency is 70-80 per cent, so you can see that the gas turbine with secondary heat recovery is very attractive.

Now suppose we do the job with a condensing double-extraction steam turbine instead of a gas turbine to produce the same kilowatts and steam. What efficiency can we expect? Only around 52 per cent instead of 72 per cent for the gas turbine method. The reason the efficiency is poorer for the steam-turbine method is because the process steam requirements are low so most of the kilowatts have to be produced by the condensing section of the turbine at a thermal efficiency of about 20 per cent.

Now let us translate these efficiencies into fuel dollars. In this mill location fuel costs

(*) Abridgments of papers presented at General Electric Conference with paper mill management, Sacandaga, N. Y., Sept. 12, 1949.

6¢/gal. If we assume full load operation (and that is the most economical for the gas turbine method) for 7,000 hrs per year, this better efficiency for the gas-turbine method means a fuel *saving* of about $105,000 per year. But the fuel saving isn't the only thing in its favor. The investment will be less; this saving, comparing a new completely installed plant, will range from $200,000-$400,000. Also, some of the other operating expenses should be less, such as labor (only a few operators are necessary) and boiler maintenance. These boilers are of the non-fired type and the gas temperature is around 800 Fahr. compared with 2,500 Fahr. and higher for conventional fired boilers.

This 6¢ fuel corresponds to $11/ton coal. Coal would have to be $8/ton for the steam turbine method for equal fuel costs. The gas turbine is not developed for coal—it uses either oil or gas.

Suppose the process steam requirements are doubled; then how do the two methods compare? The over-all thermal efficiency is more nearly equal but slightly in favor of the gas-turbine method. The substantial improvement in the steam-turbine method is due to the fact that more power is produced as by-product power. Supplementary fuel is required for the waste-heat boilers of the gas-turbine method to meet the higher steam requirements and is included in the comparison.

In one proposition we have, a mill is considering using the exhaust heat directly for drying heavy paperboards. In this case the annual gross rate of return on the investment is around 40 per cent. And that mind you for natural gas fuel that costs only 15¢/million Btu or roughly the equivalent of $4 coal.

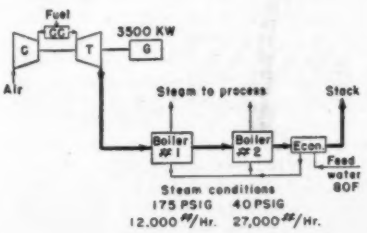



Figure 2

The Oklahoma Gas & Electric Company now has in operation a 3,500 kw gas turbine with secondary heat recovery. They are short of boiler capacity and by utilizing the exhaust heat of the gas turbine instead of steam for heating the boiler feed water, they expect to increase their plant electrical output by about 5,500 kw (more than the output of the gas turbine only) and with a slightly better plant fuel rate.

**Summary**

1. Part of the 15 per cent cost of fuel and power is a controllable expense that may be reduced by:

a. Instituting heat-recovery methods.

b. Maintaining a heat balance between steam and power requirements. Changes in steam and power requirements will affect the heat balance, so should be checked after major changes.

c. Proper selection of initial steam conditions for new turbines.

2. The fields for a topping turbine are: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a. Where additional kilowatts are required without a corresponeding increase in process steam requirements; i.e., where the electrical load growth is faster than the process steam.

b. Where old low-pressure boilers—typically the 200 lb class—have to be replaced. The steam from the topping turbines replaces that of the boiler.

3. The gas turbine has a definite place in a paper mill, but it is not a universal solution. Each application should be thoroughly studied to determine whether the steam turbine or gas turbine is the proper selection.

## Engineering Co-operation and Mutual Assistance

**A. K. BUSHMAN**
**General Electric Company**

The only place we can learn about papermaking is from you and in your plants, and we can't serve you intelligently unless we are familiar with your processes and problems. Who benefits from this exchange of information? We do most certainly. It enables us to make electrical equipment that suits your needs, and, therefore, you buy it. But just as surely you do benefit, for you get electrical equipment which *is* particularly adapted to your needs so that you make more and better paper which your customers prefer. Our sales and application engineers have a vast amount of information which they are glad to bring to bear on your problems and to assist you in working out better and less expensive ways to supply your steam and power and to distribute it; to handle your raw materials and waste more expeditiously; to detect flaws in your fast moving paper; to speed up your paper machines and regulate them more closely and to continue the technological advances which have made your industry so outstanding.

But co-operation doesn't stop here. It will produce valuable results in practically every phase of our respective businesses. Let's consider the matter of service, for example, both routine and emergency service. Sooner or later every piece of machinery needs expert attention and repair, and, of course, breakdowns always occur at the most inopportune time possible. By co-operation we can reduce breakdowns of your important electrical equipment to a negligible minnimum and at the same time save you a large part of your repair expense.

You know that it's tremendously expensive to repair a big motor or generator which suddenly develops a dead ground, kinks or breaks a shaft, rubs the iron and ruins the bearings. Not only is that repair expensive, but your costs in lost production, while you are waiting for coils to be made and parts obtained from the factory, and your loss of customer goodwill, due to delays of urgently needed shipments, are vastly more important. Let's prevent that breakdown by careful inspection of your vital units by our trained service engineers. If that old motor has been running for 20 years without a whimper, it is entirely possible that its insulation may be as brittle as charred paper. The varnish may be washed off the coil surfaces leaving them vulnerable to moisture, or creepage distances may be building up with conducting dirt. A thorough cleaning and revarnishing may be all it needs, or, on the other hand, a complete rewinding may be what the doctor orders. In either case a shut down is planned for and scheduled, and it is not an emergency. Coils and other parts are on hand before the equipment is taken out of service. The job is simple because all the expensive damage caused by failure is avoided. Loss of production is a matter of days instead of weeks. You don't disappoint your customers and you save a lot of money. It is just plain common sense to do it that way, and again both of us benefit, as is always the case in real co-operation. Maybe in this particular instance you don't see immediately where we benefit, as we sell fewer renewal parts and get a small job for the shop instead of a big one. I think this is worth taking a minute or two to explain, for we want you to know the basic philosophy of our service divisions.

In the first place we don't want work in our shops that means grief to our customers. Our shops and service divisions are part of our sales organization, and they exist primarily to insure that our customers get the service out of our products which has been built into them and to which the user is entitled.

Secondly, emergencies are expensive to us just as they are to you. We give them priority over routine work, and, therefore, our schedules are disrupted both in the shop and in the factory. Other customers, whose work is delayed, are irritated, and while we may make character with the customer who is in trouble, we lose a certain amount of prestige with others who are disappointed.

Thirdly, we can't afford to maintain adequate shops and service organizations to take care of emergencies only, because they are infrequent and they cannot be forecast or scheduled. They are a headache and are to be avoided if at all possible.

In order to maintain a strong, well equipped and well manned shop, able to handle any emergency promptly and effectively, we have to have a continuing load of regular work. Therefore, for your own protection we ask your support of our shops, and if you are not now using this service, I am very certain that a trial will clearly demonstrate the exceedingly high quality of our work, the reasonableness of our charges, and the co-operative attitude of our personnel. It is our earnest desire to serve you well.

## Protect Your Personnel and Electric Equipment Throughout the Mill

**G. W. KNAPP**
**Manager, Paper and Textile Div.**
**General Electric Company**

Electricity turns the wheels of the paper industry. The production of paper and the kilowatt hours of electrical energy required for it go hand in hand. Last year you *made* a record breaking 22 million tons of paper. Last year you *used* a record breaking 15 billion kilowatt hours of electricity.

Electricity is providing more and more the automatic processing brains as well as the muscles, for greater production, lower cost per ton, and higher quality. We, as electrical manufacturers, and you in the operating industry, both have an obligation to make sure that such a partnership is fostered under the best conditions for success.

There are certain inseparable ingredients in papermaking which can seriously affect your electrical partner, like corrosive chemicals, moisture, heat, and the 7-day week operation which has come into such general use in recent years. These things are part of the industry and cannot be changed. Electric equipment must be able to get along with them, and this is a job for us and for you.

Your goal is the elimination of electrical outages and shutdowns from these environmental hazards. This will provide the best possible protection for personnel, equipment, and for production itself.

There are two basic considerations for achieving this; *we* must strive constantly to build better equipment and *you* must strive constantly to develop better maintenance.

### Equipment

An examination of what has been done in the past and what is likely for the future, shows several broad avenues of progress in equipment design, which may be classified as developments in enclosures and insulations; and improvements in trouble spots and in application.

First of all, better enclosures have been developed for all kinds of electric equipment, to protect personnel from accidental contact or exposure, and to protect the equipment itself from atmospheric conditions for higher continuity of production.

In modern practice, switchgear (as Mr. Beeman has mentioned) and control are enclosed in cubicles, a considerable improvement over the open construction of the past.

Enclosing techniques have been improved substantially to protect rotating equipment, so that there is an enclosure for every location.

A study of the trouble spots in electric equipment is constantly being made by mill engineering departments and electrical manufacturers. One of the perennial trouble spots of electric equipment in paper mills is brush life and commutation in d-c machines, because of atmospheric conditions. A study has now been undertaken of commutation problems in mills all over the country and with all types of d-c machines.

To study bearings, we have set up at our River Works a research center which is investigating not only bearings themselves, but the various types of lubricants which are available and the frequency at which they should be applied. The latter is important because it promises to do much to reduce bearings maintenance and lubricating expense.

### Application

There is another approach by which progress is being made to improve the performance of electric equipment. It lies in the way the pieces of equipment are selected and combined into an integrated system. This is our job as application engineers working with your engineering departments, and much can be done in this manner.

### Maintenance

The maintenance of electric equipment is just as vital to its continuing performance as its design and manufacture. The paper industry with its environmental problems,

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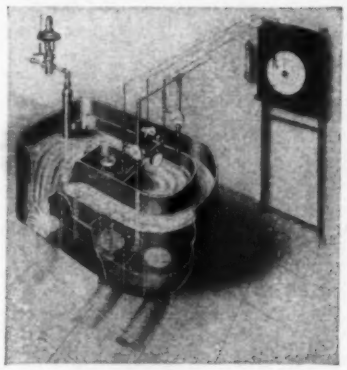

This feature alone, on the BRAMMER, is regarded by many mill operators and engineers as being worthy of its cost.

The BRAMMER CONTROL embodies many other features, such as:

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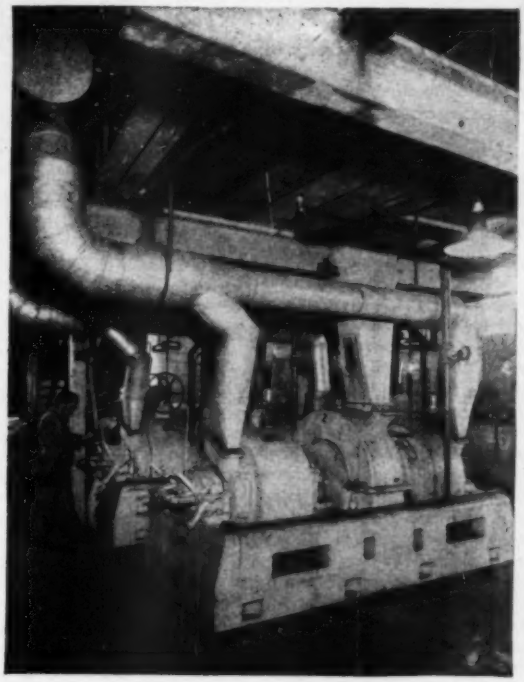

## Bauer PULPERS

**USED FOR REFINING STOCK AT NEW WALL-BOARD MILL**

THE PHOTO shows two Bauer 150-hp Pulpers which do the final refining of stock for wall-board at a new mill in the Northwest.

Bauer Pulpers are widely used in pulp, paper, and board mills throughout the world. The double revolving discs produce long, pliable, free fibers. An idea of the versatility of these machines can be gained from the following list of materials refined for a large variety of products:

- Raw, steamed, and cooked chips from soft and hard woods for insulating board, wall-board, hard board, corrugated board, plastics, roofing felt.
- Groundwood rejects for newsprint, special wrappers, and boards.
- Sulphite and soda pulps for tissue, book, and other grades of paper.
- Kraft knotter and screen rejects for inclusion in kraft board and kraft bag papers.
- Sulphite knotter and screen rejects for newsprint, boards, and specialties.
- Waste papers of all kinds (including wet-strength) for paper board, auto panel board, wall-board filler, etc.
- Bagasse, licorice root, bamboo, straw, and many agricultural residues for insulating and building boards, special papers, paper boards, felt, etc.

Complete mechanical and processing information will be gladly furnished upon request. Anyone with special pulping and refining problems is invited to take advantage of our laboratory and testing facilities.

**THE BAUER BROS. CO.**
SPRINGFIELD, OHIO

has always had to do a good maintenance job.

It has become regular practice for the industry since the war, to install electric equipment which does not need to be at the process location in control rooms that are well ventilated with clean, outside air and locked against the entry of unauthorized personnel. For small extra investment, this will save downtime, maintenance expense, and reduce the hazards of accidents, for the life of such equipment.

While motors must be exposed to the processing environment, much is being done by placing them favorably and by good housekeeping. Actually, there need not be many locations in a mill which are so unfavorable to motors, that totally enclosed construction is required. With good planning and proper cleanliness, this extra cost can be saved and reliability still maintained.

Before the war, equipment was frequently installed so it did not have a good chance of doing the job. At one time we had several brand-new motors fail in a pulp mill. They were placed so that foam from black liquor was being picked up by their ventilating openings and sucked into the windings. The foam resulted from the overflow of a duct in the floor. The mill requested us to develop an insulation that would withstand the black liquor. Our insulation experts obtained samples of it for analysis. It was found that the black liquor not only would eat any known insulating varnishes, but also copper wire, and even the metallic test containers. There was quick agreement among all parties that the solution of the problem was to get rid of the foam around the motors.

War time experience not only changed installation practices, but also developed the planned, preventive maintenance program, which had to be fitted into your almost continuous operation. The importance of this preventive approach cannot be emphasized too much. It is one of the best ways to reduce downtime on electric equipment, and lost production. Bearings, commutators, brushes, and circuit contacts should be inspected and given the maintenance required at periodic intervals with records made of work done and reports to superiors for checking and follow-up. When electronics are employed, the same technique should be used in checking tubes.

## More Usable Power, Greater Protection, and Better Service Continuity by Applying Modern Distribution Systems

**D. L. BEEMAN, Manager**
**Industrial Power Division**
**General Electric Company**

Electricity is doing more work today than ever before. That's true in every industry, be it a paper mill, steel mill, automobile factory, or the corner garage down the street. Electricity is used for more than just lights and driving a few motors. It is used for heating, process control, powering and controlling very precise and complicated machinery, such as a modern sectional paper machine drive. These exacting demands for electric power place greater demands on the electric power distribution system for greater service continuity and better quality service. Electricity can be dangerous to plant personnel, and since it is now used everywhere in the plant where all kinds of people work, the problem of safety in electric power systems is receiving utmost consideration.

Let's see how the modern power distribution system provides high service continuity, high quality service, and safety for a modern paper mill and at lower cost, too. You have just heard about power generation, so let's go through a power distribution system starting at the power house main bus. To show the progress that has been made the old and the new will be contrasted.

The power house bus is the heart of your plant. All power flows through it.

The old style switchboard is open, exposed to external hazards, falling objects, rats, and a host of other things that could put it out of commission and shut down your plant. Look at the safety hazard in all those exposed live parts which the operator must come close to to operate the switches. Everything is permanently mounted so maintenance can only be done when the board is shut down. Should maintenance be required on an emergency basis, that means a shutdown of the mill.

In the modern metal-clad power house switchgear installation all live parts are completely enclosed in grounded metal. This protects the buses and electric conducting parts from external hazards, rats, falling objects, etc. This alone is a major step in providing increased protection for your electrical system and at the system's most vital point. Furthermore, the meal enclosure gives a high degree of safety to the operators. He only turns a button to open or close the circuit breaker. Should maintenance be required, the breaker is readily removable, and still no live parts are exposed.

Cables are the arteries by which power is carried from the source out to where it is used. Many advances have been made in cable design and construction. First is the use of butyl rubber compounds for insulation.

Interlocked armor cable, while not a new development, has come in prominence because it has a steel or bronze armor to protect the cable, hence requires no conduit. This reduces cable installation costs as much as 50% compared with using rigid conduit.

Aerial cable, too, finds many uses in industrial plants. It is particularly adaptable in paper mills to long runs, such as out to the wood yard or a remote pump house. Formerly either underground cable or open wire was used for such circuits.

In a modern power system the load center principle is used where the power is carried at primary voltage, for example, 4,160 or 13,800 volts, from the power house to several load centers, such as paper machines, chippers, jordans, etc.

The heart of the load center system is the load center unit substation, which is an integrated, compact, factory-assembled package for stepping power down from primary voltage to 600 volts or less. Because these unit substations have transformers that are filled with a liquid that will not burn—called Pyranol—instead of oil, they can be located safely anywhere in the plant without fire protecting vaults.

So much for the major components of the modern power distribution systems. Now let's look at how these components are arranged in various circuit combinations.

First is the so-called simple radial system. It consists of generators, power house switchgear, and a number of primary feeders to load center substations. There is no duplication of service. This system is by far the most widely used because of its simplicity and low cost. Power service reliability is over 99%. However, should a feeder be out, all the load served by it must be dropped. Such service is generally considered good enough for the wood yard, chippers, and other services which do not have to operate continuously to keep the mill running.

However, it is felt that at least some emergency power should be available for the paper machine, main pumps, jordans, etc., which all must operate in a system to keep the mill going. Emergency power can be provided in the load center system by adding a very simple inexpensive emergency tie between pairs or substations, or by using double ended substations.

To assure provision for load growth you must at the outset do two things. First, select the proper primary voltage, and second, select your main power house switchgear with adequate margin for growth. You don't add equipment not needed now but merely select the rating of the switchgear so it can provide adequate protection even when added generation is installed.

By proper selection of primary voltage and of switchgear rating, it is easy to provide for the growth to at least twice or three times the present size of the plant. Selection of proper voltage costs no added money, but generally saves money on the initial step and adequate rating switchgear to allow for load growth compared with switchgear just big enough to get by now represents only a few thousand dollars in a multimillion dollar paper mill.

## Why Pay More to Handle Your Materials

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**Manager of Sales**
**Lumber & Paper Industries Sec.**
**General Electric Company**

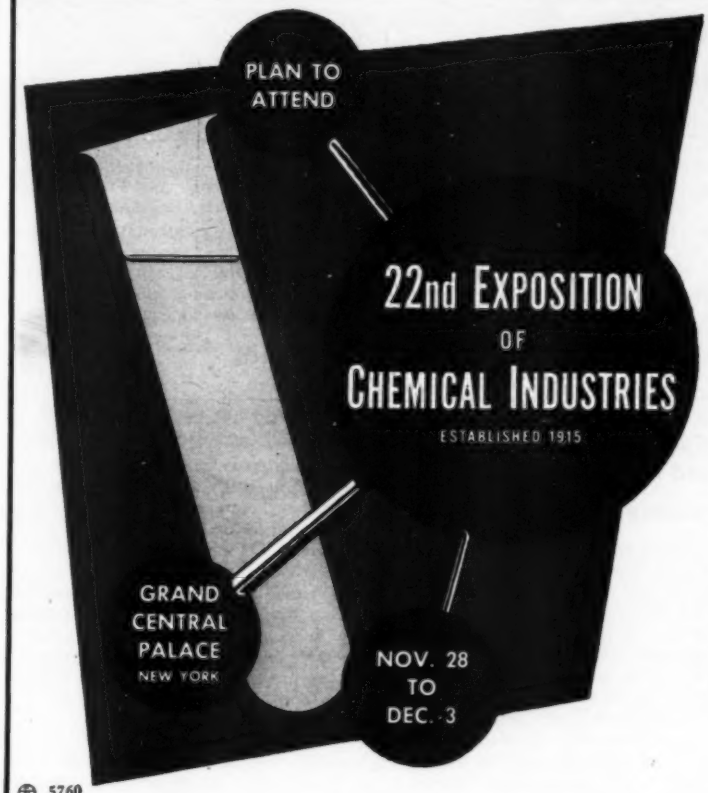
We are all looking for that magic formula that will take those seemingly opposite forces—higher quality and lower cost—and come out with an answer acceptable to our customers.

Here is a natural. Materials handling accounts for 10 to 15 per cent of your entire manufacturing cost of paper. Since material handling is accomplished by unskilled labor and adds nothing to the product—except cost—why not consider this, then, your area of great opportunity.

It is more than just: "Save money and *maintain* quality." Fringe benefits from improved material handling will improve *quality*.

For instance, *higher morale* because work is made easier; and *less absenteeism* because accidents are minimized; will both show up in better product quality.

Let's look at the opportunities for improved materials handling from two points of view. First, how the principles and philosophies can be used in your operations

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and second, how our industries, directly and indirectly, can be of tremendous assistance to all other industries.

Because of the tremendous scope of materials handling in all phases of industry, this discussion will apply only to receiving, warehousing, and shipping of materials.

What are the three basic types of materials handling equipment that mean so much to all of us? These may be broadly described as: the conveyor, the crane and hoist, and haulage equipment. These can be used singly, or in combinations, as determined by the specific requirements of your individual applications.

The fixed conveyor, used for moving large quantities of material continuously over fixed routes can also become an efficient sorting machine. For instance, an automatic conveyor system for handling cartons of different sizes can sort the boxed material into appropriate shipping areas. An electric eye sees a black index mark printed on the side of the various cartons and routes the right box to the proper loading area.

What about cranes and hoists? You have found a variety of uses for these in your operations. One paper mill estimated a saving of $52,000 a year in reduced spoilage, over previous methods of handling and warehousing, through the use of modern crane equipment.

In the field of industrial haulage, the tractor, economical in hauls of more than 300 ft; the fork truck, used with the pallet system of material stowage and movement; and the powered hand truck, useful in confined spaces, have all received wide acceptance in industry. For example, there is the case of one electric fork truck that made possible the maximum use of overhead space for paper storage and enabled a publishing company to cancel plans for acquiring 10,000 more square feet of warehouse space. In addition, boxcar unloading time was reduced 66%.

Perhaps the daddy of them all in this third category of industrial haulage equipment is the Diesel-electric locomotive. Many lumber, pulp and paper mills have switched from steam locomotives to Diesel-electric locomotives for their heavy yard hauls—and for good reason.

The 45-ton Diesel-electric switcher at Southland Paper Mill, Lufkin, Texas, has a fuel savings alone, averaging $27.65 per day. At this rate, the locomotive will have returned its original investment in 3 years. The absence of sparks on the Diesel-electric reduced the danger of setting paper and pulpwood on fire.

In 1943 the Nekoosa-Edwards Paper Company replaced a steam locomotive with a 65-ton Diesel-electric. Switching costs have been reduced 50%, and for seven years they have enjoyed an average of 98% availability. Of particular importance is the elimination of cinder and smoke nuisance alongside their finishing room where paper must be kept clean.

As the Ford Motor Company booklet *Material Handling Standards* says, "Progress in material handling does not wait upon technical development as much as it does upon the development of organization, on the application of the best principles and practices of management and on the open-minded point of view."

I would like to show you how our own people study this problem. We are *organized* to co-ordinate the 15 Apparatus Department businesses on a department-wide basis to meet the challenging opportunities to cut costs and improve quality.

Vendor participation has long since been a logical starting point in the study of efficient material handling. The design of our suppliers' package should be compatible with our handling requirements, not just at our receiving point, but beyond and deep into our manufacturing processes.

A thoughtful supplier can ease our burden of handling. The material is unloaded from a common carrier, transported to storage in a stockroom, warehouse, or the like, and later transported to the manufacturing process.

Our ultimate goal, customer's acceptance, is our last planning stage where we, as a manufacturer, can extend any additional benefits in handling to our customers. Material must be received by the customer in good condition, and also in a form suitable to their receiving operations. We become vendor participants from our customers' point of view. Many of you already are helping us meet our customers' needs by co-operative studies of his handling problems.

We want our suppliers to give us the same treatment. Our suppliers are both you—and many of your customers. Your contributions to our handling efficiencies will be direct in the products you sell to us; and indirect in the products we buy from others.

The economic principle of the unit load or palletized system is this: the more pieces, pounds, or tons moved in a single handling operation, the lower the cost per piece or per pound or per ton and the shorter the time required to move any given volume.

*Paper pallets* can handle surprisingly heavy loads by gaining rigidity from the shape of their components, which are securely glued together. So far, these are being used only in the Schenectady Works for the shipment of refrigerator relays to our Erie Works. Incidentally, the 90c wood pallet is a strong competitor since the cost of paper pallets is running something over $1.20.

The estimated saving in 1949 for our Apparatus Department will be $300,000 through the use of expendable pallets. What is the equivalent savings in handling by our customers? If it fits their handling methods as well as it does ours, their savings could be equal to or better than the savings we realize.

Yes, the possibilities of reducing WASTE in the field of materials handling are tremendous. Last year, if all industries could have cut their handling cost 25%, the result would have been a saving to industry of more than $2 billion. There are countless "tricks" in *many* trades using conveyors, cranes, and hoists, and industrial haulage equipment. Management has begun to actively participate in the *organization* of these "tricks" and equipments in the broadest sense. We must all be alert to our individual contributions and interdependence in this field. Let us resolve to help each other bring about better products at lower costs.

## Can We Plan on Atomic Power?

**HARRY A. WINNE, Vice Pres.**
**General Electric Company**

I suppose most of you realize that the atomic power plant of the future will release its energy in the form of heat. Nobody today, so far as I can find, foresees any feasible way of converting directly from atomic energy to electricity. That very unique natural element, Uranium-235, and the equally unique artificial Plutonium are simply atomic fuels, or more correctly nuclear fuels. Of course, they release energy by splitting atoms instead of, as in the case of coal, by combining atoms with oxygen, but the result is still heat, although about 2,500,000 times as much heat per pound of nuclear fuel consumed as that from burning a pound of coal.

The General Electric Company, in the Knolls Atomic Power Laboratory which it is constructing and operating for the Atomic Energy Commission at Schenectady, is developing, designing, and starting construction on an experimental atomic power plant of comparatively small size. The heat will be removed from the reactor by means of a liquid metal circulating through the reactor and through a heat exchanger. In the heat exchanger the heat will be transferred to water, generating steam which will supply a turbine-generator which will generate useful electric power.

We do not expect this initial experimental power plant to be economical. It is an experimental developmental unit. In constructing and operating it, we shall learn a great deal. There are many technical problems to be overcome.

So, if you ask me whether atomic fuel will ultimately compete with coal and oil, I don't know, but I think there is good chance that it may, several decades hence. But don't look for free power. Remember, this is only a new *fuel*, and the cost of fuel accounts for only about 20% to 25% of the total price paid by all consumers for fuel-generated central station power today.

As to time scale, we hope to have our small experimental plant in operation in about 3 years. Assuming we have reasonably good luck with it, we might be ready to start the next step after a year or two of operation. And then there will be other steps, all requiring time to lick the technical problems. I am satisfied we can solve them, but I am not at all sure about the economic questions. Satisfactory answers to these I think are going to take much more time.

So I don't look for atomic energy to have any particular impact on our power situation for several decades, and it will not be a sudden impact, but a gradual development. In any case, I believe atomic energy will not supplant but only supplement our present sources of energy.

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## Technology in the Japanese Pulp and Paper Industry*

**HAROLD R. MURDOCK**[1]

Japan lost all of its possessions but the four original main islands—Hokkaido, Honshu, Shikoku, and Kyushu—as a result of World War II. These islands comprise a total land area of 91,051,500 acres. This land is approximately the size of the state of California, but on it has to live over 80,000,000 people, which is more than half the population of the entire United States. Japan is a mountainous country, so that only 15,000,000 acres of land are capable of cultivation for agriculture. Current yields of foodstuffs are not sufficient to feed the population, although indigenous food supply is augmented with over 70 billion pounds of fish caught in adjacent waters. While Japan may succeed eventually, in producing a bare subsistence requirement, there appears to be no escape from the conclusion that some food will always have to be imported, particularly in the light of the net increase in population of more than 1,000,000 persons per year. Any indiginous increase in the domestic food production is of real interest to the American taxpayer who now pays over $1,000,000 a day for imported food essentials.

The forest resources of these four islands is not adequate to meet the economic levels desired for the Japanese, although 68 per cent of Japan is considered to be forest land as compared to the 16 per cent suitable for agriculture. Because of excessive demands for wood since 1937, Japan has been rather consistently overcutting its forests. Today, informed sources believe that the Japanese are consuming twice as much wood as is growing each year. Consequently, conservation of timber, pulpwood, mine props and fuel-wood are of great importance.

The Oji Paper Manufacturing Company produced over 85 per cent of the paper and 95 per cent of the wood pulp consumed in Japan before World War II. Because of this, there was no over-all technical organization in the industry. This company obtained its technology from other countries, either by studying the literature from these countries or by actual visits to the United States', Canadian and Scandinavian mills. The chemist and engineer in Japan was poorly paid, given little encouragement, and rarely did he ever reach an important position within the organization. Advancement was based more upon time employed rather than ability. Even in the Oji Company, technical men in one mill never visited other mills of the Company and were seldom able to learn about the company operations other than their own assignment. Research was negligible, but ability to copy foreign methods and processes as the means for keeping up to competition, was at high level.

Primary problems were:

1. Better utilization of pulpwood.
2. Better forest management and reforestation plans.
3. Dissolution of the Oji Paper Manufacturing Company to strengthen competition within the industry.
4. Sponsorship of a technical organization to serve as a medium for educating those young members of the industry who have natural inclination towards science.
5. Increased pulp and paper production.

This was our plan in late 1946. Today, each of these projects has reached the status of having advised the Japanese in detail as to what should be done. Some projects have gone even further. Five mills are in full production of semichemical pulps. The Oji Paper Manufacturing Company has been dissolved, and a healthy technical association has been established in the industry. Paper production today is twice that existing in 1945.

The war took its toll from the pulp and paper industry of Japan. Three of the larger paper mills were almost completely destroyed from bombing, followed by fire. A major rayon pulp mill and the second largest newsprint mill in Japan were dismantled by the military and converted into war plants. The rayon plant, after conversion, produced war chemicals, while the newsprint mill was converted to a plywood aircraft manufacturing plant. Only two airplanes are reported to have been completed. The greatest loss to the industry, was Karafuto and northern Korea where the most modern Japanese pulp mills existed. These were large kraft and sulfite pulp mills which used the spruce and fir forests adjacent to the

(*) Abridged from an address given before the fall meeting of the Technical Association of the Pulp and Paper Industry held in Portland, Oregon, September 12-15, 1949.

(1) Head of Pulp and Paper Branch NRS, GHQ, SCAP from September 1946 until August 1949. Now Chemical Process Engineer with Robert & Company Assoc., Atlanta, Ga.

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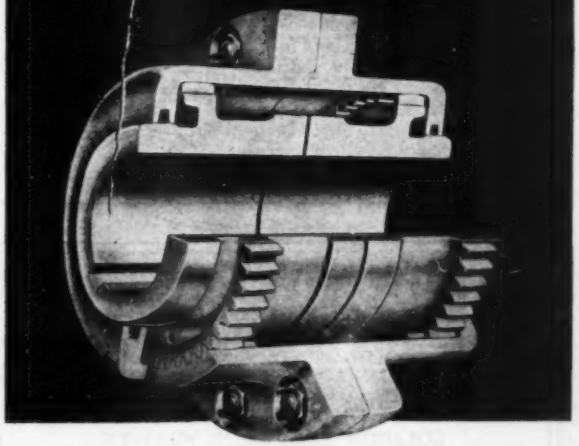

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# FLEXIBLE COUPLINGS

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mill site. Today, these mills are being operated by the Soviet Union.

The major production of paper in Japan is called foreign style and simulates papers produced by other nations. In the peak production year of 1940, 1,467,146 short tons of foreign style papers, 200,035 tons of Japanese style machine made papers and 35,853 tons of Japanese hand made papers were produced. Comparison of these figures with 1945 and 1948 shows the serious impairment in production due to the war, and the present recovery of the industry, which falls far short of the peak year of 1940.

| Type of Paper | 1940 | 1945 | 1948 |
|---|---|---|---|
| Foreign Style | 1,467,146 | 267,515 | 361,943 |
| Japanese Machine | 200,035 | 21,965 | 105,448 |
| Japanese Hand | 35,853 | 2,000 | 5,176 |
| TOTAL | 1,703,034 | 291,480 | 472,567 |

The abrupt increase in Japanese machine made papers in 1948 is due to their not being under price control. The shortage of printing papers created a market for Japanese Senka printing papers at prices three or more times the price of controlled foreign style printing papers.

There were 534 foreign style pulp and paper mills reported on January 1, 1949, as members of the Japanese Pulp and Paper Association. 54 were woodpulp mills only, 100 more were integrated mills with both pulp and paper production while the balance of 380 mills produced either or both foreign style papers and Japanese style papers. The Japanese Hand Made Paper Association reported 8,975 homes and factories producing hand made papers. It is estimated that around 3,000 more homes in rural Japan are also producers of these handmade papers. Statistics for 1948 show that of all the above producers, only 24 pulp mills produce more than 5,000 tons of pulp per year and only 9 paper mills manufacture more than 5,000 tons of paper per year. The largest producing unit is the Tomakomai mill of the Oji Paper Manufacturing Company in Hokkaido. In 1948, this mill accounted for more than 32 per cent of paper production and more than 75 per cent of newsprint production in Japan. It was started in 1910 to make Japan a self-sufficient nation in newsprint.

Groundwood accounts for 58 per cent of Japan's total pulp production, primarily because newsprint and other groundwood containing papers amount to over 60 per cent of all the papers made in Japan. 410,347 short tons of groundwood were produced in the peak year 1941 in Japan proper, and 52,055 tons were manufactured in Karafuto which was lost to the Japanese at the end of the war. 84 mills are reported today to have grinder installation. With but few exceptions, these mills have only one small pocket grinder. Today, Japan has 15 magazine grinders. The Tomakomai mill has 8 of these magazine units besides 46 pocket grinders.

There are 17 sulphite pulp mills in Japan, eight of which are designed primarily to produce rayon quality pulps. The others have no bleach plants. Over 300,000 tons of unbleached sulphite could be produced from these mills, two thirds of which could be bleached to rayon pulp. In general, the Japanese have Karlstad digester systems which are in good condition. With an ample pulpwood supply, these sulphite mills could assist greatly in meeting the paper demands in Japan.

There are five small kraft mills in Japan. Although they have been built since 1938 they are not modern from an American point of view. For instance, they use old Swedish rotary and stationary smelters to recover their chemicals. Furthermore, because of the shortage of salt cake they operate at low sulfidities and use substantial percentages of caustic soda as a make-up chemical.

The Japanese machine made papers are little understood by the average foreigner. There are hundreds of small mills producing these papers. Outstanding in this production is the use of the tuberous roots of a Hibiscus plant called Torororoai. These roots are preserved in formaldehyde before maceration in water to produce an unusually thick jelly, which, when added to a pulp suspension, keeps the fibers floculated so they can form soft textured sheets on a Yankee type cylinder machine.

The fibers for the Japanese style papers are also unique. Besides the use of some sulphite and groundwood, best fiber from the mitsumata, silk mulberry and kozo (often called paper mulberry) plants are used. Mitsumata was the sole fiber used in making currency papers before the war, when hand made methods were used exclusively. Silk mulberry fibers are the chief constituents of Japanese machine made papers while Kozo is almost exclusively used for hand made paper production.

The foreigner who visits Japan is always enthusiastic over the beauty and uniqueness of Japanese hand-made paper. Practically every village on the slopes of the mountains where agriculture is a marginal operation, is engaged in such paper production. These artisans had learned their trade from their fathers and grandfathers for many years. The war destroyed this link and consequently destroyed the perfection in the process. Some artisans were killed in the war, while others failed to return to their home after the cessation of war activities. Because of this situation, Japanese papers no longer retain the beauty, permanence and unique character of pre-war days. The industry today is decadent, due to many causes. These difficulties can be overcome and hand made papers superior to pre-war production can be produced when more careful attention is given to the use requirements of the papers and the preparation of the paper making fibers. It has been fascinating to help these people who depend so much upon their paper production for their meagre existence.

From the above, it is apparent that Japan has a wide variety of pulp and paper establishments. Given the pulpwood, chemicals and coal, the existing industry could produce sufficient pulp and paper of the present quality to meet the average paper consumption of prewar Japan.

Expansion of the industry and improvement in pulp and paper quality in order to meet external competition, will be found difficult in Japan. The industry is at least 15 years behind the rest of the world in applied technology. On many occasions, it has been necessary to decide, in fairness to the American pulp and paper industry, how much modern technology should be given to the Japanese. The Occupational forces have had no explicit policy on this point. The decision was made that technical aid to the Japenese should be given only when such information helped the entire industry, and then only when the data could be placed into practice within a period of six months. This decision was found to be practical. During 1947 and 1948, increased production did not require new processes. Coal, chemicals, pulpwood,


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and transportation problems were then the vital factors. Today, the paper industry, if it is to improve quality, needs modern process methods. You will be impressed with the simplicity of some of the technological improvements we have already made in Japan. Material savings have been effected by introducing improved methods of processing pulpwood. One of these, a semi-chemical pulping process, adapted to present sulphite pulp mill equipment, yields one-third more pulp than the former process, and gives considerably better quality papers. Another improvement was the addition of locally procured volcanic ash to pine pulp in order to overcome pitch difficulties, in the manufacture of newsprint. Because of the shortage of salt cake in Japan, the kraft mills have had to resort to use of caustic soda. Recommendations that the Japanese use sulphur in their kraft digesters improved quality and yield of pulp.

The lack of suitable modern testing equipment has created difficulties in establishing and maintaining specifications. One of the first projects was to establish specifications for papers in Japan, but existing equipment is so old and obsolete that it is almost impossible to place pulp and paper testing on the same basis as other countries. While importation of modern testing equipment used in Allied countries appears to be the most practical means of standardization, it involves the problem of obtaining dollars with which to purchase such equipment and better understanding by the Japanese regarding patent ability and trade rights of foreign equipment.

## Social and Economic Aspects of the Pulp and Paper Industry*


**E. W. TINKER**
**Executive Secretary**
**American Paper and Pulp Association**


The days when major industries of the nation could carry on their operations without public understanding have departed. Further than that, there is a grave danger that if such understanding is not had, basic but unnecessary changes will be made that will disrupt the normal productive operations and the logical and orderly growth of the industry. We do not stand alone in this situation but we are one of the country's major industries and we are peculiarly vulnerable to the effects of plans developed by our social and economic planners. You may be sure that with few exceptions the moves made by the legislative and executive branches of the government have an impact upon the pulp and paper industry and to some extent are of concern to you as individuals. To that extent it is a matter of self interest that knowledge of the industry and of its problems be disseminated.

Perhaps by reviewing some of the elements that contribute to justifiable public concern with the welfare of the industry, we can lay the groundwork for understanding.

The pulp and paper industry is a considerable factor in the employment and payroll situation in the nation. A very high percentage of mill labor is, as you know, of the craftsman or semi-craftsman type. The capital investment required per worker unit is the highest of any in the country and wages are relatively high because of the skills required. Among all industries the pulp and paper industry ranks at the top from the standpoint of stability of employment. At the present time employment in the production of paper and paper products and in printing and publishing is over 1,100,000 full time employees who receive over three billion dollars annually in pay. In 1947 the total combined sales of these industries was over 10 billion dollars.

Our requirements for pulpwood approximate 20 million cords a year. It is impossible to measure accurately the number of worker units required to produce this wood because a large percentage of it is the result of part time operations and particularly seasonal operations on farms. However, it is estimated that it furnishes a substantial part of the livelihood of some 300 thousand workers.

All in all a very conservative estimate of the employment afforded through the operation of pulp and paper mills would be 1,400,000 individuals. This means that between five and six million people are dependent upon the industry for a livelihood.

The above figures do not include more or less independent operators whose activity is dependent upon the well being of the pulp and paper industry. To illustrate, the

(*) Abridgment of address given before the fall meeting of TAPPI held in Portland, Oregon, September 12-15, 1949.

industry pays approximately 6 per cent of the national bill for freight paid to the railroads. We are the largest customers of the naval stores industry, which is a substantial factor in the employment situation of the South. You are well aware of our enormous requirements for chemicals, fuel, and other raw materials.

Because of the very large capital investments required and the need for accessible supplies of raw materials, the pulp and paper industry is one of the country's least migrant industries. Over the years, because of these factors, large sections in the United States have become, to an increasing degree, dependent upon pulp and paper mill operations for their economic life. I cite the Northern Lake States, a large portion of Northern New England, entire regions in the South, and some of the major watersheds of the Pacific Northwest. The fact of the matter is that there are some 176 communities in the United States that are 50 per cent or more dependent upon the operation of our mills for their continued existence.

Vast additional supplies of paper and board have resulted from the development of new sources of wood supply in the last twenty years. Since 1929 overall paper and board capacity has increased by 60 per cent. Each region has shown an increase running from over 10 per cent in New England to 570 per cent in the Southern region. The Pacific Coast capacity increased almost 80 per cent in these twenty years.

I have no doubt that you are aware of the position of the paper industry in the scheme of things. However, at the risk of repetition, it seemed desirable to place before you some of these major considerations as a reminder that the industry is of great importance in the national economy.

It is insufficient for you and I who live in intimate contact with the industry to have this information because it is more and more essential that public understanding be had. Certainly we should expect that communities wholly or in part dependent upon our operations be fully informed. It will be no news to you that there is a strong trend towards centralization of public controls and a growing inclination to legislate the conduct of industry affairs. If these trends are not reversed the cold hard fact is that local authority, with its intimate knowledge of local conditions, will be frozen out of the picture and management will be compelled to give more and more consideration to the risks involved in plans for expansion and development or even in normal operations with the ever increasing threat of unwarranted public controls.

While it is unpleasant to think of, it seems necessary that you and I as employees of industry recognize the fact that somewhere along the road we have done an extremely poor job in selling industry to the public as a benefactor. In general we live in an atmosphere saturated with the socialistic idea that private industry is something in the nature of a public enemy and requires shackling in one form or another to protect the public interest. In my opinion, this situation has been brought about because of a reluctance, and a natural one, on the part of management to take the public into its confidence by keeping it fully informed of the industry's problems, its merits, and its benefits.

If there are five or six million people in the United States dependent directly upon the operations of the pulp and paper industry, this should be a matter of general public information and yet I am constantly surprised and disappointed at the lack of knowledge and appreciation on the part of individuals, and particularly individuals in Washington, to whom the welfare of our industry should be a matter of major concern.

Very recently I had an opportunity to discuss with a group of faculty members and graduate students, at the University of Michigan, the subject of governmental participation in conservation moves. I presume I was given this opportunity because the pulp and paper industry uses large quantities of our natural resources and particularly timber. I made the statement then and I repeat it now, that to my knowledge there is not a company in the pulp and paper industry that is engaged in the manufacture of pulp that is not making plans for a permanent supply of wood to maintain their operations in perpetuity.

It is inevitable that the pulp and paper industry will lead the way in forest conservation in the United States and unless the ability to plan for the future that has been so characteristic of executives in the industry in the past has suddenly disappeared, the expansion of this industry or its stability will never be curtailed because of a shortage of raw material in the form of wood. I expect that most of you know this is true but I would hazard a guess that there are employees in your own companies that have fears with regard to tenure of their jobs because of propaganda with respect to devastation of our forests.

No statement discussing the social and economic aspects of the pulp and paper industry would be complete in these modern times without relating the industry's position to national and international affairs. The pulp and paper industry, as well as other industries, has great difficulty in obtaining understanding in Washington circles. It appears to be the fashion to view industry contacts and consultations with suspicion and to undertake them with reluctance. The situation is not particularly different from that which existed during the war when the industry so laboriously struggled to get appreciation of the facts with regard to the essentiality of its products and the requirements that would have to be met if these products were to be produced.

A word with regard to the future of the pulp and paper industry in the United States. Given an even break and assuming that the industry will not be disrupted in its natural development there seems to me to be no question of its potentialities. I am not prepared to state whether we will require 30 million tons of paper and paperboard in the year 1960 or 40 million tons. However, I believe it is inevitable that there will be a large increase in our requirements. I know that there are men in executive positions in the industry that have appreciation of this fact. It does not take too long a look back to recognize that the situation 15 or 20 years ago was recognized by the Cullens, the Lukes, the Meads, the Zellerbachs, the Sensenbrenners, the Everests, and many other men of vision. I believe the same vision and the same courage exist today, but today this vision must include consideration of the environment in which industry in the United States will live 20 years from now. A thorough-going program of co-operation between government and industry in my opinion would be the most stimulating factor that could be conceived of in assuring maximum future social and economic benefits to the people of the United States. We should only strive for understanding that will bring about this co-operation.

## Camas Bleach Plant*

**J. V. SAVAGE**
**Crown Zellerbach Corporation**

Our bleach plant had its beginning several years ago when the entire industry started to take a frantic inventory of the pulpwood situation for "tomorrow." A careful cruise of C-Z holdings by our timber department established that a substantial percentage of our timber was Douglas fir.

Any of you who have had experience with it know that Douglas fir has different characteristics than the more commonly used species for pulping. The most desirable property is an unusually high tear strength. However, Douglas fir heartwood contains a coloring matter that makes bleaching to high whites a rather tough assignment.

We wanted to bleach pulp from this wood and maintain the strength advantage. We also wanted enough flexibility built into the plant to take care of several different contemplated color specifications as well as wood species.

The engineering involved in the Camas plant is beyond the scope of this paper; however, I would like to touch on it from an operations point of view. The building is of unusual construction in that the roof is arched to support its own weight, eliminating the usual columns or crossbeams. This gives the operating floor an open appearance that has impressed most of those who have visited the plant. The control panels and washers are located on this floor. All piping and other equipment are on lower levels. A double rail track system just outside the building permits four chlorine tank cars, one caustic and one lime car to be in use, or connected up for use at the same time.

The lime for bleach liquor making is unloaded into a 200 ton capacity concrete silo by an airveyor system. It is fed from the silo into a Dorr slaker and classifier by a variable speed screw conveyor. Four large storage tanks are provided for hypochlorite. It is pumped from here to a constant head tank on the bleach plant roof for supply ahead of the Rotometers.

The caustic soda is unloaded from the tank cars into storage tanks at regular 50%

(*) Abridged from a paper presented at the 1949 Joint Spring Convention of the Pacific Coast Branch Technical Section, Canadian Pulp and Paper Association and Pacific Coast Division, The American Pulp and Paper Mill Superintendents' Association, Inc., held May 20-21 in Victoria, British Columbia, Canada.

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strength. A supply tank is kept full of 3.5% caustic soda by means of a Foxboro level controller linked to a Treet-O-Control meter which is in turn linked to a "Proportioners Inc. ¾" Treet-O-Unit. A pump from the 3.5% storage tank supplies a constant head tank on the roof along with the bleach liquor tank.

The chlorine is piped from all four cars to a manifold inside the building where the operators can tap from any of the cars by opening a valve numbered to correspond with spot stations on the track.

Compressed air for $Cl_2$ unloading is supplied by compressors used for that purpose only. The air is passed through a condenser, filter, Lectrodryer, and a calcium chloride drying unit before it is used in the chlorine system.

The pulp for bleaching is made in a new addition added to the original kraft mill. The pulp is run through knotters and washers and into two high density storage tanks. It is pumped from here to the flat screens, over deckers and into either of two 20 ton chests which are the only screened stock supply ahead of the bleach plant.

Kraft bleaching consists of two phases:

1. Removal of the remaining lignin left from the digestion process.
2. Bleaching out of the brown color associated with kraft cooked pulps.

Calcium hypochlorite is the most expensive of the bleaching chemicals, it is the least selective, and is the most harmful to strength. Based on this fact, our plant is designed to produce a pulp pretty well free of lignin before the hypochlorite stages are reached.

The lignin is rendered partially soluble by chlorine gas. The solubility is completed by caustic cooking. Two stages of each are employed with an agitated water soak after the first and most severe caustic extraction stage. The pulp strength at this point is actually greater than the original unbleached pulp.

The amount of hypochlorite bleach liquor necessary to complete the bleaching is very small (about 1.5% of the A.D. pulp) and no strength is lost in bleaching to 80 G.E. color.

The stock is pumped from the brown stock storage to a consistency controller and stock meter. The recording meter measures the stock flow or production rate for the plant. A mixer at the bottom of the chlorination tower receives the stock from the meter and mixes the chlorine gas with it before discharging into the tower. The chlorine is measured by rotometer. The pulp consistency is 3.3% A.D. and the retention time in the tower is one hour at 150 tons per day production rate.

The chlorinated stock is washed, thickened and discharged into the first caustic mixer directly over the caustic cell. The pulp is pressed by squeeze rolls to about 17% consistency then diluted with hot water and caustic soda to 11% and 160 Fahr. The retention time in the high density stage is maintained by a variable speed screw discharge from the bottom of the tower into the dilution chest.

This stage is followed by an agitated soak at 3.3% A.D. Stock is then washed and discharged into a second chlorine mixer and tower identical to the first stage. Amount of chlorine that can be used to advantage in this stage is determined by the severity of the previous stages and the concentration of alkalinity in the pulp. The second chlorination is followed by another caustic extraction using ⅓ as much caustic and 140 Fahr.

The pulp has been going through a process of purification rather than bleaching up to this point. The actual whitening process can now be accomplished with a minimum of hypochlorite bleaching liquor.

The first hypochlorite stage is a high density cell similar to the caustic cells with screw discharge at the bottom. Consistencies of 10% are maintained and a temperature of minus 90 Fahr. The *p*H is maintained in a safe range by addition of caustic soda.

A second hypochlorite stage follows using two low density (6%) towers in series. The temperature and *p*H are controlled in the same range here. This is followed by an $SO_2$ flash tower where the stock is agitated at a *p*H of 5.5 for 1 hour. After washing, the stock can go directly to low density storage for the paper mill, or by shutting off dilution water, it can be conveyed by belt to high density storage.

As mentioned earlier, flexibility was essential in the operation for coping with the various colors and wood species that we are called on to process. A system of 3-way valves and pipes along with the necessary chemical treating equipment makes it possible to alter the bleaching sequence several different ways.

For instance, 100% Douglas fir can be bleached better by using the first caustic cell

as a high density hypochlorite stage. This is necessary only for color in the range of 85 G.E. or better. We can also skip any of the stages, using only that number necessary for the particular grade in process.

During periods when semi-bleach pulp of 30.0 to 70.0 G.E. brightness are being made, more than half of the plant is by-passed. In the very near future we expect to use this equipment for special sulphite bleaching, during the periods when it is available.

The operation is a continuous one so it is apparent that any change in either consistency or bleachability must either be corrected at once or compensating chemical treatment started.

The consistency controller has done a good job, so our only touchy point is changes in bleachability or as often happens, changes in the percentage mixture of wood species. We have found the operation to be much more easily controlled by making most of our compensating chemical changes entering the hypo. stages rather than to do it farther back in the system.

The tests we make for control purposes are: consistency, color, Wiles bleachability, and *p*H. Everything else is recorded by instrument.

The plant uses approximately 70,000 gallons of water per ton of pulp. Steam usage is in the range of 4,000 pounds per ton. Average chlorine usage expressed in per cent of the total by stages is as follows:

| | | |
|---|---|---|
| First chlorination | 75% | |
| Second chlorination | 10 | |
| First caustic | 3 | * |
| Second caustic | 1 | * |
| First hypochlorite | 10 | |
| Second hypochlorite | 5 | |
| Sulphur dioxide | — | |
| Caustic used for buffer | 1 | * |

(*) The caustic is the actual usage based on A.D. pulp.

The $SO_2$ stage has been found unnecessary for pulp to be used in slush form by our own paper machines. It is used only on pulp to be dried and baled for export. As you, of course, know the principal purpose of $SO_2$ is to prevent color reversion on the dryers or in storage. This appears to be more true of pulp than of paper.

The electric power usage is 196 kw per ton when all stages are used. The electrical layout includes a system of interlocks which are important in a continuous system. A kick-out of any important motor will automatically kick out the equipment ahead of the failure, back to the first point where a build-up of pulp can be handled. All of the motors in the entire plant are operated from the top floor where ammeters indicate the load and signal lights indicate from a distance whether or not individual motors are operating.

Like everything else connected with the industry the final verdict is determined by the quality of the product coming off the dry end of the paper machine. To date we have made paper from the various bleach grades in weights from 40 lb to 200 lb for a wide variety of uses.

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## Material Handling in Specialty Paper Mills*

**D. D. HALL**
**The E. B. Eddy Company**

Management of paper mills is becoming conscious of the fact that from 8 to 10 per cent of its payrolls go for material handling. It has been realized that in a mill having an annual payroll of $1,000,000, $80,000 to $100,000 is spent on something which does nothing to convert wood into specialty paper—it is just spent on moving material around. Obviously, the cost sheets for the mill where man handling still is in vogue, show instead of $80,000 to $100,000 for handling, $140,000 to $176,000, or from $60,000 to $76,000 per year increase.

As most types of handling equipment increase the day's work of a man at least by 200 per cent, or makes it possible for one man to do two men's work, the saving by mechanization is 50 per cent. Thus equipment which costs $30,000 in the above mill can pay for itself in one year. The mill with a $5,000,000 payroll and no mechanized handling can afford to allocate $150,000 for equipment, and expect to save enough in one year to pay for it.

The main thing is to set down each phase of each move in terms of weight, time, distance and manpower in a uniform manner. The engineer must supervise the time study and ensure that all variations of the moves have been studied and duly noted. He notes the lack of work and the overloads that occur at certain times of the day. He notes the excessive lifting and tugging that results in spasmodic work and lost time accidents. When all this data is collected in a prepared form, his ingenuity commences. He weights the average loads and distances according to records or observations. Then he calculates the unit cost of each phase of each move of material, so that he can tell positively the saving to be obtained by eliminating that phase.

*Abridgment from paper presented at the annual meeting of the Technical Section of the Canadian Pulp and Paper Association, Montreal, Quebec, January 26-28, 1949.

The survey of material handling is at an end when the unit cost of each phase of each move is known, but recommendations to alter the procedure or to obtain mechanical equipment generally follow. In fact, the engineer generally makes up a forecast survey for each new procedure or piece of equipment in a similar form. From this he can calculate positively the savings to be expected from the equipment simply by subtracting the forecast operation cost from the existing one. Here I must point out that great care must be applied to obtain the unit operating cost of mechanical equipment. For instance, there is a vast difference between the Canadian and American cost per hour of operating fork trucks. Low cost electric power in Canada reduces electric fork truck operating cost, while high priced gasoline increases the gas fork truck cost. Also, the operating cost per hour increases as the load factor decreases. For instance, this effect is greater for the gasoline fork truck than with the electric, if the basis of comparison is tons per hour handled.

Mechanical handling equipment in paper mills varies according to date of installation, popularity of the type at that date, and quite often according to the knowledge of the engineer who recommended it. There are mills using one type of handling equipment for everything from bow to stern, regardless of the advantages of different types for different operations. One mill will be using platform trucks and skids with slow elevators, while another will use cranes, another conveyors, etc. I will, therefore, describe types of equipment and their characteristics with which I am familiar as a refresher or to open up new solutions to your handling problems.

### Pulp Transport from Sulphite or Groundwood Mills to Specialty Mills

(a) *Slush pumps, pipe line and chests*—high first cost, low storage capacity requires constant demand, saves lapping costs and has lowest operating cost.

(b) *Railway car loads of lapped pulp*—high first cost, lowest operating cost providing load factor is high and one mile minimum haul. Recommend where slush system impractical.

(c) *Truck and tractor trailer loads of lapped pulp*—truck operating cost highest, do not recommend. 5-ton open trailer lower operating and first cost but dirty and for short haul only. 12-ton van trailers—recommend for one mile hauls. All trailers should have floors reinforced to allow loading by fork trucks.

(d) I suggest consideration of air-veyor blowing of dried pulp for short distance transport.

### Lapped Pulp Transport Within Mill Storage Areas

(a) *Gas or electric fork trucks and pallets*—I consider this is the lowest cost and most flexible type of equipment available today. The size of the pallets should be such that sufficient loads can be carried with the lowest loss of pulp (caused by excessive overhang). Pallets used by The E. B. Eddy Company are made of hardwood, are 48 in by 36 in in size, are steel-reinforced to prevent nails lifting and have over a two-year life. They cost $4.85 and require approximately 60c per year maintenance. The pallet load can be stacked two high with wet pulp and four high with dry baled pulp successfully. The limits of storage capacity are:—

(1) Clearance height of ceiling and floor capacity.

(2) Capacity of elevators serving the storage and beater elevators.

The flexibility of fork trucks is recognized since they can be used anywhere in the mill providing the floor capacity is sufficient. For instance, a 3,000 lb loaded truck can operate providing capacity exceeds 250 lb per sq ft and elevator has capacity of 5 tons.

It is a necessity to use gas operated fork trucks where long ramps exist. In closed areas gasoline fumes have not been found obnoxious providing air changes are frequent. Cost of maintenance of gas trucks has been found to be higher than electric and since it has been necessary to provide a standby truck in isolated mills to prevent mill shutdown, our use of gas trucks has

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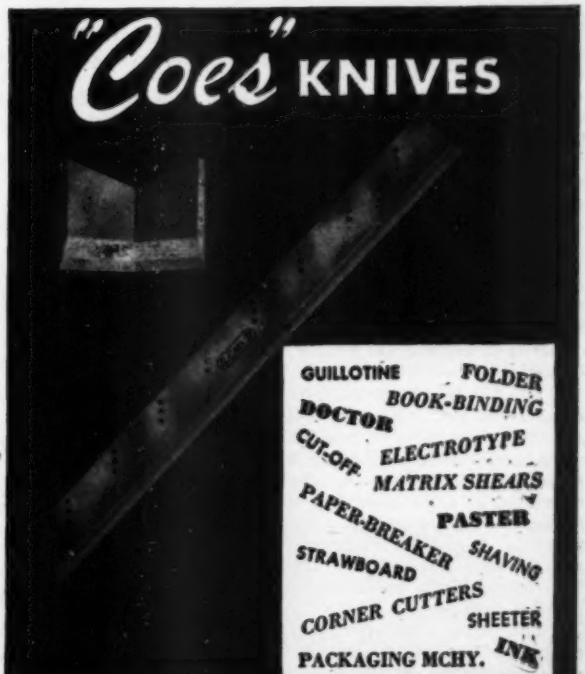


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narrowed down to ramp, low capacity floor areas and exterior operations. Should some gasoline truck manufacturer develop a clutchless truck, no doubt a more equalized maintenance cost would result. In fact, the electric truck driven by a Readipower Unit (gasoline motor-driven generator package unit) is a very expensive attempt on the part of manufacturers to eliminate clutch maintenance. I might say that the highest quality fork truck is the best to buy. It seems to me there is room for improvement in the quality of workmanship in those presently on the market. There is a trend towards improving their speed, size and capacity per unit gross weight, but I think that for the price ($8,000.00 for a 3,000 lb capacity fork truck with extra battery) a higher standard of quality is justified. At the present time the choice of electric fork trucks should be made from the load, capacity, size and weight limitations standpoint only. There is little difference between the trucks made by three or four manufacturers as regards to quality, service or price. The load capacity obtained should be not more than 10 per cent in excess of the normal load to be carried, since the heavier the counterweight, the more wear on the steering mechanism. In fork trucks, excessive capacity is not an advantage and may on rough crossings prove expensive since 90 per cent of the heavy counterweight load is carried on steering wheels when the truck is unloaded.

(b) *Gas or Electric Platform Trucks and Skids.* Where low ceilings and/or low capacity elevators and/or extra storage is available, and where pulp is to be moved without stacking, platform trucks and skids are frequently used. There are some who consider platform truck handling is faster than fork truck because of the greater clearance under the skid. I consider this is a matter of truck speed and experience of the driver. I do know that at The E. B. Eddy Company lapped pulp skid maintenance cost is $5.50 each per year and original cost of 60 in by 42-in skids amounts to $22.00 each. The breakdown of steel legs which spread-eagle under rugged handling and deterioration because of sliding over rough spots, are the main objections to the use of skids. The platform truck weighs approximately 800 lb less than the fork truck, unless equipped with an elevating hoist when the difference is less than 350 lb on a 3,000 lb capacity fork truck.

(c) *Overhead Crane and/or Monorail Carriers*—are useful for high ceiling storage areas where pallet loads are stacked in narrow areas as high as four up. The main advantage is the height to which pulp can be stacked or lifted from deep well type storage areas to beater floors or loading platforms. Their most frequent use exists where boats are unloaded. It is relatively low cost equipment and maintenance cost is lowest of all types.

(d) *Power Conveyor.* This type of transport of pallet loads from one building to another has the one advantage of saving elevator operations, etc. when passage is indirect. However, its use for conveying single laps of pulp requiring full time loading and unloading is very expensive, the average wage cost being $2.00 per O. D. ton of pulp compared to 25c per O. D. ton using pallets.

(e) *Roller Conveyor*—can be used with pallet loads to feed beaters and pulpers in order to reduce the number of moves by fork trucks and to ensure a continuous supply of stock to beaters.

(f) *Electric hand trucks*—for either skids or pallets, are very flexible and can be operated with little experience. Their low first cost has frequently recommended their use for pallet handling to beaters and pulpers where fork trucks are not justified. Until the bearings and the general workmanship on these palletizers is improved, they should not be used for heavy duty with double faced pallets. With single faced pallets, which have been used successfully, at least 50 per cent savings can be expected, and their use removes the most glaring waste in paper mills today—one man pulling a skid load of pulp with two men pushing it.

(g) *Lowerators*—for skid or pallet loads for transport between floors are an advantage over elevators only if they are connected by conveyor or monorail systems.

(h) *Elevators*—are necessary evils, but which I prefer when compared to space wasting ramps. However, an elevator under 5-ton capacity and floor size of 10 ft by 6 ft has no place in a paper mill. The common 2500 lb elevator installed in a mill 25 years ago has paid for itself and should be replaced. I feel strongly that the present high prices of heavy duty elevators require attention. It strikes me that some of the "gold plating" secreted in the concealed parts of modern elevators should be discarded. In fact you can build three single story warehouses 86 ft by 50 ft for the price of one 5-ton elevator, having a lift of 40 ft. Probably, that is why one story warehouses are being built instead of replacing the old elevators. This trend is well-known but for the mills with property restrictions, I suggest the alternative lowerator which has so far been available at a justifiable cost.

Ragged materials, drums, etc. also can be handled by similar equipment as is used for lapped pulp. I prefer pallet handling which utilizes storage space to the maximum and reduces maintenance cost by 90 per cent.

Broke handling is a Dr. Jekyll-Mr. Hyde case and I think the loose broke phase is the Mr. Hyde variety. It would be easy to cure this phase if all broke were shavings, and beaters were under the machine floor. Air-veyor blowing would make it possible for paper mill superintendents to write off the problem. But broke will be broke, and come what may there are going to be sheets and even cull rolls to get back to the beaters. Where frequent changes of color and grade make it necessary to store the broke, it can be baled and stacked by fork truck. In fact, where beaters or pulpers are located two floors above the sub-machine floor, I feel that baling all broke by means of a baler immediately below the broke chute is economically sound. Ungainly broke trucks carrying a maximum of 200 lb of loose broke use up all the elevator time, storage area, and at the same time waste manpower.

### Finished Product Handling

Finished product handling depends on the form of the product.

*Rolls* are efficiently handled:—

(a) By machine hands for distances up to 50 ft.

(b) By fork trucks where storage is horizontal and rolls are to be stacked, with a saving of two men on rolls stacked three high and more men where stacked higher.

(c) By monorail or monorail crane, either power-driven, manual or motivated by monorail tractor. This equipment is not as flexible as a fork truck, but may have a lower first cost.

(d) Power conveyor between buildings. Only recommended where monorail or fork trucks cannot serve because of cost of loading and unloading plus storage where necessary at destination.

*Sheet Stock*—in view of the common use of platform trucks by printers and other customers, the use of skids must be continued for sake of uniformity in the Finishing Room. Hence, platform trucks are used —electric for long hauls, hand for short moves. Providing skids have 4 in wide legs, they can be stacked in storage by means of fork trucks.

*Cases*—pallets and fork trucks are the most economical type of equipment for this purpose, but skids and platform trucks are still used. Our plans include conversion so that when the customers are able to handle pallets, we will be prepared, and for the present, two men piling cases can be put to more useful work.

In regard to shipping, all loading is done by hand to save shipping charges on heavy skids. I do not consider the advancement of the light-weight disposable pallet in Canada as on a par with U.S.A. since prices are too high. However, when customers change over to fork trucks to stack their paper, there will no doubt be a frenzied splurge in the use of this light-weight disposable pallet. Whether the railways will carry them as freight-free dunnage depends on their interest in advancing the used of modern handling methods.

Under the heading of *Suggestions to Improve Material Handling in Paper Mills,* I will not even mention equipment. There are two facts that must strike you. One is the thousands of dollars taken out of our pockets, for which we get no return, to pay for handling excess quantities of pulp during days or weeks when not required because of the grades scheduled, followed by days or weeks of overtime work to handle sufficient to meet demand of another combination of grades.

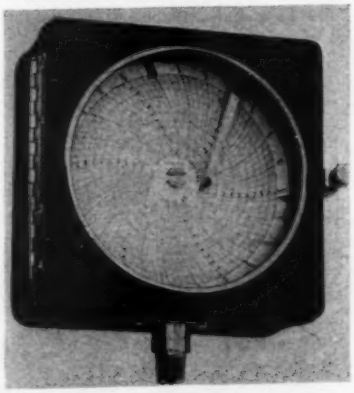
The second matter which has startled me is the way handling costs are hidden in the mill operating costs. General labor, maintenance and mill depreciation cost accounts are the wells into which flow the largest share of material handling costs. Surely the cost of handling which amounts to 8 per cent of the wages of most mills is large enough to control. I wish I could control $50,000 a year. When this same handling expense of $50,000 per year is dropped into a reservoir of $5,000,000 it doesn't splash enough. Likely your accounting departments are working eight hours per day plus some extra hours on Sundays and nights like you are—but I doubt it! Hence, what additional cost should there be in splitting accounts enough so that material handling costs can be shown separately and thus, provide the means of controlling them.

# New Products . . . . . .

## Recording Gauge

*Requires little maintenance other than that of a high grade clock*

Record of conditions, trends and variations not otherwise available except by observation and manual tabulation can be obtained by a self-contained recording gauge known as Minicorder Pressure, Type 3. The measuring element is a spiral Bourdon tube, wound and calibrated, that is suitable for water, gas or other liquids



and gases not corrosive to brass. In case of damage or change in range to the tube, replacement can quickly be installed in the field. The Minicorder Pressure gauge is equipped with a ¼-in male bottom connection and can easily be screwed into vessels or pipe lines. Ranges from 0 to 10 psi to as high as 0 to 1,500 psi are standard. May be either 24-hour spring wound or synchronous electric. The Dickson Co., 7420 Woodlawn Ave., Chicago 19, Ill.

## Smoke Abatement System

*Increases combustion efficiency and saves fuel.*

Plibrico Jointless Firebrick Co., 1800 Kingsbury St., Chicago 14, Ill. has available the PliOjet system, an over-fire air system for smoke abatement. Practical application of the over-fire air-jet principle with this new system prevents smoke formation

through injecting secondary air into the fire where it is needed and mixing it with the unburned gases. Jet air stream forced into the firebox provide the necessary air and turbulence to mix the volatile gases with the oxygen and obtain complete combustion. Every installation is engineered and installed according to prevailing conditions.

## Carboy Drainer

*Provides safe handling of acids.*

Wahlert Safety Products Corp., 25 Lafayette St., Brooklyn 1, N.Y., is manufacturing a new product called "Safety Carboy Drainer" which fits different sized carboys and eliminates spilling and splashing of acids. Uninterrupted liquid flow is guar-

anteed through an ingenious air vent thus making pumping or syphoning unnecessary. Vent and spout are made of hard, durable, acid-proof rubber. Every part is replaceable. Three sizes are available—the "Junior" for five-gal. carboys with 1¾ in. to 2⅛ in. neck, the "Standard" for 10 to 13 gal. carboys and 2¾ in. to 3 in. necks and the "Large" for 13 gal. carboys with 3¼ in. to 3½ in. necks.

## Packaging Equipment

*Expedites banding of products.*

Better Packages, Inc., Shelton, Conn., has introduced to the market three new taping machines.

The Belsinger box taping machine solved the sealing problem of the new Belsinger box, a telescope type container. This equipment can be adjusted in a matter of seconds to any Belsinger box, regardless of

width, height, weight, or position of seam. An adjustable taping head guides the tape strip around the box, centering it over the seam. A foot switch operates the power turn-table, turning the box as the tape is applied and leaving both hands free to rub down the tape strip. Models are available with or without the compressor which holds the packed box together with a 50-lb. pressure while tape strip is applied.

Tackon No. 12 is a dispenser for Pressure Sensitive tape. It can be preset to measure tape up to 12-in. lengths, and can be set to dispense duplicate lengths for production sealing, or can have selective measuring. This machine is adapted to cellophane tape sealing of bags, cannisters, packages, boxes or cartons, banding sets of merchandise, holding movable parts in place, etc., using widths of tape up to 2 in. Tape roll is completely enclosed.

Counterboy 500-C fills a definite requirement for a machine that would handle tape and expedite the banding of products. This unit dispenses and cuts off a strip of tape with the moistening gum side up. A sponge rubber belt and series of rollers partially wraps the tape around the box or object to be banded, leaving only the ends to be affixed by the operator.

## Magnetic Separator

*Virtually eliminates rejects.*

A chute-type magnetic separator has been placed on the market by Bauer Bros. Co., 1759 Sheridan Ave., Springfield, Ohio, for demetalizing the cleaning solution of an electroplating system.

The magnet is inserted in a sloping tray emptying into a funnel, the assembly being installed over the cleaning tank of an electroplating system. From time to time, a pump is operated to circulate the cleaning solution across the magnet, removing iron

particles. Cleaning and plating solutions remain serviceable longer, which lowers renewal cost and lessens the number of shutdowns required for changing solutions and cleaning the tanks.

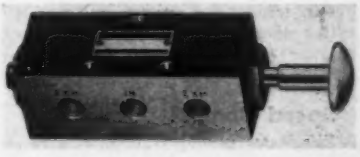
The manufacturer states that magnets can be treated to handle a large variety of liquids, thus making the separators applicable to the demetalization of oil, coolants and other fluids.

## Plunger Valves

*Can be operated with a minimum of effort.*

C. B. Hunt & Son, Inc., Salem, Ohio, is marketing an entire new line of small single plunger valves known as Series "O" and "OE" valves.

These valves are claimed to be of simple design, sturdy construction and well suited



for use with manually controlled presses, pilot circuits and in other processing cycles when frequent manual operation is required. Units can be used with air, oil or water, at pressures up to 125 psi maximum (also vacuum), and at normal temperatures not exceeding 150 Fahr. Class "O"

valves have piped exhaust. The "OE" valves have an open exhaust and should be used with air only.

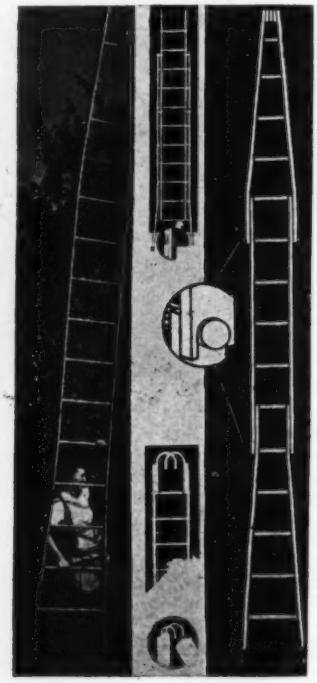
Both series are furnished tapped for either ⅛ in. or ¼ in. pipe connection and are available in 2-way; 3-way open exhaust; 3-way piped exhaust; double 2-way; 4-way; and 5-way designs; and with either push-pull or push and spring return actions.

## Aluminum Ladder

***Requires no replacement or upkeep.***

Zero-Lite Products, 317 Sherman St., Chicago, Ill., has available a complete line of aluminum extension ladders.

Made of aluminum throughout, side rails are 2½ in. x ¾ in. x .065 in. 61 ST wall tubing extruded and drawn. Joints have no rivets, bolts or welds. Top of rails are smoothly rounded and at foot there are heavy duty, solidly inset rubber feet. Rungs



are specially ribbed for safe and sure footing. Two sets of slide guides on the extension ladder assure maximum strength and rigidity.

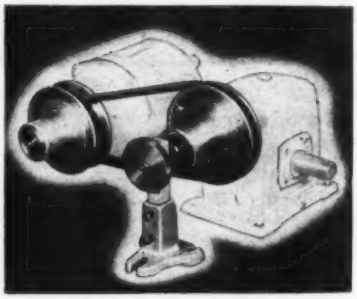
Sizes range from 6 to 20 ft. in straight ladders, 16 to 40 ft. in extension ladders, 16 to 24 ft. in orchard ladders, 6 and 4 ft. sections on window cleaners' ladders and 4-ft. sections for estimators. The 6-ft. section of a window cleaner's ladder weighs under 7 lb. and a 40-ft. extension ladder weighs only 50 lb.

## Speed Control

***Eliminates need for an adjustable motor base.***

A new 1 or 2 hp, low-cost, 6:1 ratio, variable-speed control using standard "B" belts, with fixed centers at any distance, has been announced by Speed Selector Inc., 118 Noble Court, Cleveland 13, Ohio.

The complete assembly includes two variable pitch sheaves and control . . . a spring-loaded sheave mounted on the motor shaft and the control sheave mounted on the driven shaft. Changes in pitch diam-



eter cause the standard V-belt to actuate the spring-loaded motor sheave, thus giving stepless speed control over a 6:1 range. Remote control can be easily applied.

Special design features assure correct belt tension on fixed center distances and correct belt alignment is maintained at all speeds. Lubricant cavities are large and accessible. The "B" section belt is easily replaced in a few seconds without removing other parts.

This drive is highly flexible and easily adapted to any application up to 1 hp or greater at reduced ratios.

## Welding Alloys

***Seals leaks on cast iron.***

Eutectic Welding Alloys Corp., 40 Worth St., New York 13, N. Y., has available a welding alloy which it claims can be used for every type of job with the exception of aluminum. The new product is especially adaptable for cracked motor blocks and heads where it can be used on the spot, in position and without dismantling. Its bonding temperature is only 500 Fahr.

## Static Eliminator

***For use on paper bag machines, envelope machines and special machines for handling tissues, glassine, cellophane, etc.***

Chapman Electric Neutralizer Co., P.O. Box 268, Portland 6, Maine, is producing new, low-voltage static-eliminating equipment with anticipated application to many machines and manufacturing processes where space limitations make it impractical to install high-voltage equipment; and also where an individual type eliminator, without external high tension wiring, simplifies installation.

This company's new Model LV static eliminator consists of a power unit hung on a simple bracket attached to the machine with one or more inductor bars, 1 in. outside diameter, together with attachment fittings, cable guides and ducts.

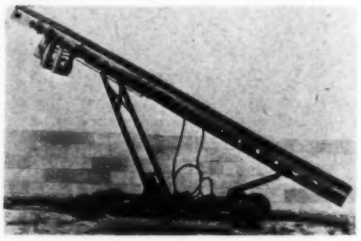
The unit is especially suited to standard and special machines where space for inductor bars is limited or where individual type equipment is preferred.

## Belt Conveyors

***Hydraulic control of belt speed permits reverse action.***

Introduced by Lake Shore Engineering Co., Iron Mountain, Mich., lightweight, portable, Tote-All belt conveyors are now available with hydraulically controlled belt and mounted on a new hydraulically controlled Duo-Lift frame. The hydraulic system is powered with either an electric motor or gasoline engine. Speeds range from 0 to 400 fpm, and make possible handling of a wide variety of materials.

The Duo-Lift frame is mounted on four wheels with pneumatic tires and permits several positions for the conveyor. Height of the low end of the conveyor can be adjusted from 20 in. to 48 in. and of the



high end, from 48 in. to 15 ft., depending upon conveyor length. Standard conveyors are available in lengths from 10 ft. up in multiples of 2 ft. and with belt widths of 8 in., 10 in. and 16 in. Special lengths and widths can be manufactured to order.

## Chemical Derivatives

***Offers possibility of new zein modifiers and zein film improvers.***

Six new chemicals derived from the OXO process have been announced by Rohm & Haas Co., Department SP, Washington Square, Philadelphia 5, Pa. These chemicals are nonanoic acid, nonylamine, nonyl aldehyde cyanohydrin, alpha-hydroxydecanoic acid, octadecenyl aldehyde, and octadecyl alcohol.

Many potential uses for these products are suggested. Nonanoic acid, nonylamine and octadecyl alcohol contain familiar functional groups whose reactions are well-known and for which industrial applications are numerous. Nonyl aldehyde cyanohydrin, alpha-hydroxydecanoic acid and octadecenyl aldehyde are not as familiar industrially but they are reactive chemicals that offer opportunities as intermediates.

Nonyl aldehyde cyanohydrin and alpha-hydroxydecanoic acid may be converted to amides, esters, amino acids, diamines and phenolic ketones which may have applications as plasticizers, pharmaceuticals, dye intermediates, rubber chemicals, oil additives, synthetic resins, corrosion inhibitors, etc. Alpha-hydroxydecanoic acid has shown considerable promise as a modifier for zein, not

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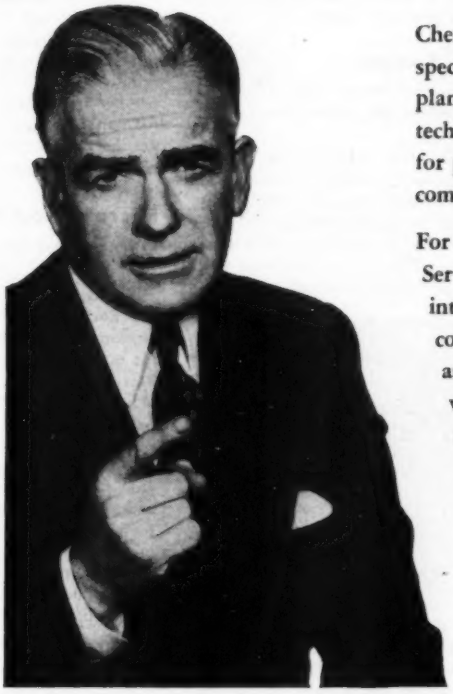
Sodium Nitrite
Para-dichlorobenzene
Ortho-dichlorobenzene
Monochlorobenzene
Methanol
Ammonium Chloride
Formaldehyde



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| 400 | Al. Chlrs. | ANY | 4000 | 514 |
| 350 | Gen. Elec. | IP | 2300 | 720 |
| 300 | Westghse. | CW | 2300 | 367 |
| 300 | Al. Chlrs. | ANY | 2300 | 720 |
| 300 | Westghse. | CW | 440 | 900 |
| 250 | Gen. Elec. | IM | 2300 | 450 |
| 250 | Cr. Whlr. | | 440 | 600 |
| 250 | Ideal. | | 440 | 720 |
| 125 | Gen. Elec. | IM | 2300 | 720 |
| 100 | Westghse. | CW | 440 | 575 |
| 100 | Al. Chlrs. | ANY | 440 | 720 |
| 100 | Gen. Elec. | IM | 440 | 900 |
| 75 | Gen. Elec. | IM | 440 | 514 |
| 75 | Cr. Whlr. | 25Q | 440 | 585 |
| 50 | L. Allis | GH | 440 | 870 |
| 35 | F. Morse | | 440 | 1800 |
| 30 | Lincoln | Crane | 440 | 900 |
| 30 | Gen. Elec. | MT | 220 | 900 |

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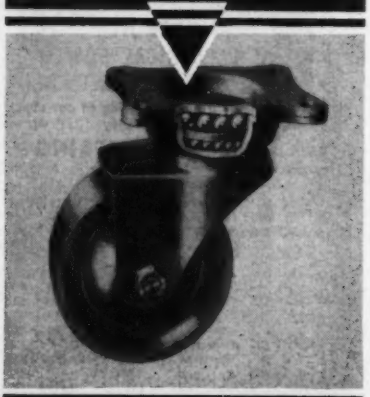

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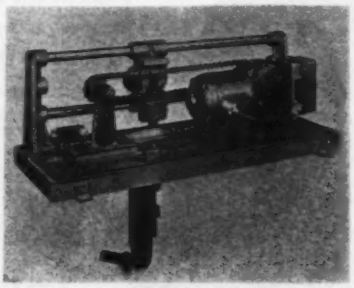
only for poasticizing the protein but also as a homogenizer and for improving zein films. The Schiff's bases from octadecenyl aldehyde and aromatic primary amines may prove to be effective rubber accelerators and anti-oxidants, with a further possibility of the preparation of synthetic drying oils.

## Automatic Sampler

***Adaptable to the mining, stone products, ceramics, chemical and allied process industries.***

Hardinge Co., Inc., 240 Arch St., York, Pa., has placed on the market an automatic sampler which takes periodic "cuts" or samples from a stream of moving material, either wet or dry, at any stage in a continuous process. The unit is automatic and can be set to operate periodically at a



variety of time intervals from 5 to 60 min. When activated by a time switch, the sample cutter moves horizontally at a constant speed across the stream of moving materials, diverting a representative sample into a sampling launder or container. The cutter movement is controlled to avoid stroke speed and length variation during each cutting operation.

## Protective Mask

***Permits free and easy breathing while it extrudes particles of dust.***

Parker Safety Equipment Co., 785 Lyons Ave., Irvington 11, N. J., has introduced to the market a sanitary non-inflammable plastic face shield held in place by replaceable elastic bands. A laminated cotton gauze refill pad is attached to the shield, which permits free and easy breathing. The company recommends this mask for many different kinds of nuisance dusts and paint spray mists except where fine silica dust, lead, arsenic and other toxic dusts are present.

The mask and refill combined weigh less than ½ oz. Cotton refills are packed 25 to a box. Introductory trial orders are being offered by this company.

## Transfer Adhesive

***Moisture proof and not affected by acids, alkalies, salts, cleaners or alcohol.***

A new product offered by Glyco Products Co., Inc., 26 Court St., Brooklyn 2, N. Y., known as Flexo Wax C Light, is used as an adhesive for cellophane to hard surfaced paper.

This new product serves as a rapid, accurate method of map, plan, design or graph reproduction. Cellophane, on which symbols, names, etc., are printed, is coated with a thin coating of the adhesive by means of a roller machine. The coated material is then pressed on hard surfaced paper and stored until needed. When needed, the desired symbol is cut from the sheet, pulled off the paper and pressed to the map, graph or plan, the wax acting as an adhesive. Photographs can then be made and plates made for printing the finished sheet. Printed cellophane strips can be applied to a photo negative and by changing the symbols, a number of differently designated copies of the same background can be made. This product does not throw light shadows on the photographed negative.

## Microscope Attachment

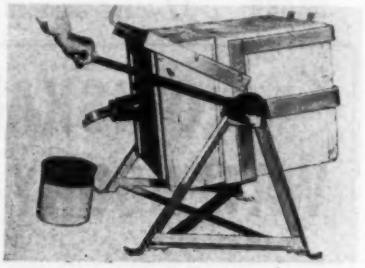
***Provides three types of reflected illumination.***

Bausch & Lomb Optical Co., 635 St. Paul St., Rochester 2, N. Y., has developed an attachment that can be readily attached to the body tube of any standard non-objective microscope for the examination of opaque or semi-opaque specimens. The changeover from dark field to bright field illumination is instantaneous and is controlled by a lever. A Polaroid polarizer and cap analyzer provide for polarized examinations. Reflector and optical parts of the attachment are completely enclosed, affording protection against breakage and dirt seepage. It is claimed that the attachment does not impair the focusing of the microscope and is expected to have wide application in biological and metallurgical research as well as in the plastics, textile, and other fields.

## Carboy Tilter

***Provides safe, fast and convenient method for draining and pouring acids.***

General Scientific Equipment Co., 2700 W. Huntingdon St., Philadelphia 32, Pa., has placed on the market a new carboy tilter that fits carboys of any size. The tilter is made of riveted and welded structural steel to insure a strong, durable unit.



A locking device permits pouring of liquid at any angle. Safety features are the air vent pouring spout, made of acid resistant rubber and plastic tubing, that insures an even flow of acid without spurts or splashes and the long handle that operates the unit which permits the operator to remain a safe distance from the acid.

## Anion Exchanger

***Increases the scope of ion exchange technology.***

Full plant-scale production of Amberlite IRA-400, basic anion exchanger, has been announced by Rohm & Haas Co., Resinous Products Div., Philadelphia, Pa.

This new product is claimed to be the first

# ORGANIZED SAFETY PAYS!

The accident rates on non-member industrial plants average 73% higher than the rates of National Safety Council members. Yet Council services for an entire year frequently cost less than a single accident.

The 315 members of the Pulp and Paper Section cordially invite you to share the safety materials, services, information exchange, and activities which they have found so valuable in their efforts to prevent accidents to their employees.

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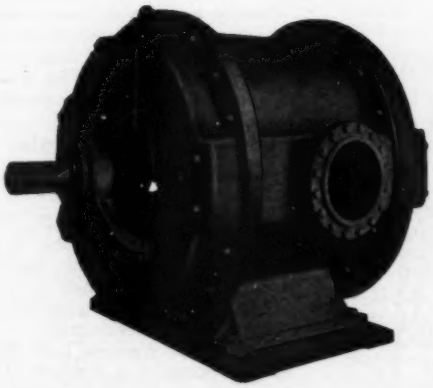

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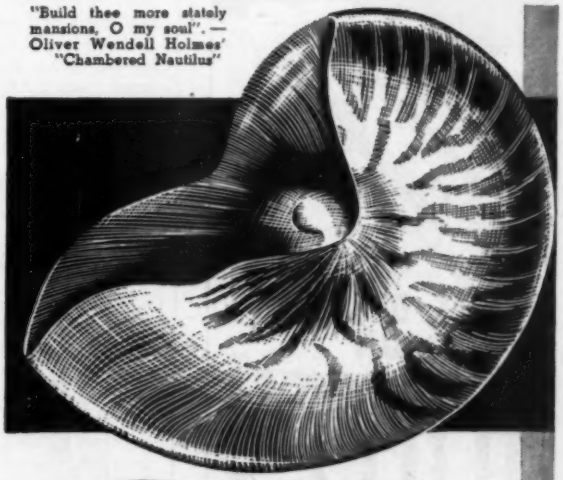
**NASH ENGINEERING COMPANY**
**SOUTH NORWALK, CONNECTICUT, U. S. A.**

"Build thee more stately mansions, O my soul". — Oliver Wendell Holmes' "Chambered Nautilus"



The only worthy industrial expansion is that which is founded upon the quality of the product manufactured. That thought has been behind the growth which has been enjoyed by Lindsay for 45 years.

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resin adsorbent which can be utilized to split neutral salts complete and to convert salts to the corresponding free bases of the metallic ions. IRA-400 will adsorb negatively charged ions from acid, neutral and even mildly alkaline solutions in a *p*H range from 1 to 10.

In specialty applications apart from water conditioning, it adsorbs all amino acids with isoelectric points below *p*H 10. In deashing operations it is capable of removing the anionic impurities first, a reversal of the usual deionization procedure.

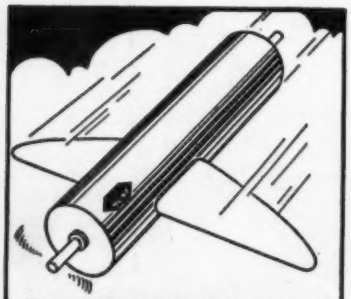
According to the manufacturer, the resin can actually be mixed with a strong cation exchanger to prepare an adsorbent bed that will completely deionize solutions in one column and in one step.

## Floor Surfacing

***Withstands severe conditions destructive to floors of asphalt and concrete.***

A new floor surfacing material designed to resist especially severe conditions is now being produced by United Laboratories, Inc., 16801 Euclid Ave., Cleveland 12, Ohio. The product is known as Quartex and is claimed to be ideal for surfacing floors subjected to alkalies, oil, grease, fats and many floor destructive elements found in industrial and institutional plants of all kinds.

Quartex is applied directly over the old surface at a depth of approximately one-half inch and is ordinarily ready for use within thirty-six hours. Heavy loads do not effect this surfacing and its application makes it unnecessary to replace old surface.

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FOR WET FELTS

plus patented features that give greater value.

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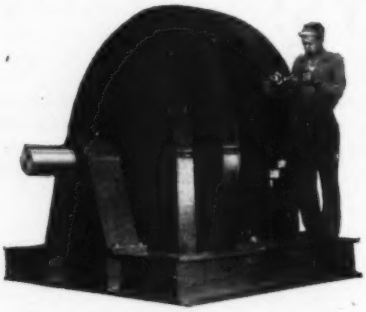
RODNEY HUNT MACHINE COMPANY

38 Maple Street, Orange, Mass., U.S.A.


## A-C Motors

***Feature protected construction.***

A new available line of protected-type large a-c motors, giving a high degree of protection against splashing or dripping liquids, has been announced by Electric Machinery Mfg. Co., Minneapolis 13, Minn.

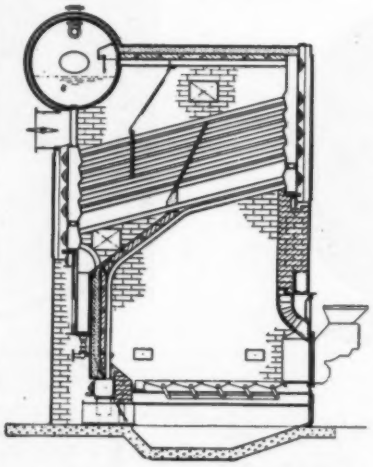


These motors correct power factor while they drive the load and are used for medium-speed and high-speed applications. Protective enclosures reduces maintenance, increases motor reliability and provides control of ventilation. Recommended applications for pulp and paper mill drives are beater and pulpers, jordans and refiners, chippers, grinders, hogs and shredders, motor generator sets, high speed centrifugal pumps, fan pumps, compressor and vacuum pumps and fans.

## Water Tube Boilers

***Readily adapted to oil or gas firing.***

Springfield Boiler Co., 1973 E. Capitol Ave., Springfield, Ill., has announced the availability of a series of six new standardized water tube boilers especially designed for coal firing with standard stokers. Sizes range from 7,500 to 17,000 lb. per hour guaranteed steam generating capacity.



All parts are externally supported for simple erection and easy accessibility. The boilers are made with two standard tube lengths, 10 ft. and 12 ft. expanded into electric steel sectional headers. Furnace width varies depending on whether five, six, seven, eight, nine or ten header sections are used. All units have 48-in. diameter welded, X-rayed and stress-relieved steam drums built to various pressure standards ranging from 160 to 320 psi. Over-all setting height is 18 ft. for all sizes.

Chief application for these boilers is for power, process, or heating service in small to medium size plants and for standby service in larger plants.

## Tractor

***Handles bulk materials in congested areas where working space is small.***

Tractomotive Corp., Deerfield, Ill., has announced the availability of its new materials handling tractor known as Model TL-B Tracto-Loader. This tractor is equipped with a hydraulically-controlled, ten cu ft standard bucket that can be dumped in whole or in part to a height of approximately five ft. The bucket has a forward crowd action and an automatic "tilt-back" feature that permits getting a load without ramming.

The Tracto-Loader will go into a standard 6 ft wide box car door without backing up or jockeying around, and, according to the manufacturer, it will handle 20 to 25 tons of most bulk materials per hr on a 300 ft round-trip haul.

Over-all length with bucket down is 9 ft 5 in; over-all width, outside tire measurements, 4 ft 6 in; wheel base, 4 ft 1 in. Major tractor components are from Allis-Chalmers tractors. Brake horsepower is 27.8.

## Photoelectric Colorimeter

***Gives a concentration reading accurate to within 0.1 per cent.***

E. Leitz, Inc., 304 Hudson St., New York 13, N. Y., now has available to industry the new Rouy Photrometer which makes possible colorimetric analysis by careful matching of the photo-electric cell and the direct reading microammeter.

Each of the ten narrow band glass filters and filter elements is controlled in production and matched to produce identical spectral transmission curves. Further accuracy is insured by the use of a precision square absorption cell which eliminates errors possible with ordinary curved cells. It is claimed that different workers can obtain identical readings on the same specimen, even on different Photrometers.

All adjustments are made with a single control and no special skill is required of the user.

The compact, lightweight Photrometer takes a 115-volt a-c line. Where only d-c is available, terminals are provided for connection to a 6-volt storage battery.

# New Literature . . . . . .

## Book Reviews

THE FORESTRY DIRECTORY. Compiled by Tom Gill and Ellen C. Dowling. Published by American Tree Association, 1214 16th St., N. W., Washington 6, D. C. 1949. Cloth-bound. 420 pages. $3.00.

Information on forest conservation, including statements on the development and present work of all federal and state agencies, semipublic, industrial and other organizations concerned with this field, are incorporated in this book.

An entire section is devoted to forestry education, giving its historical background and describing the facilities available in the United States and Canada. A discussion of the purpose and administration of national forests, together with a list of locations and areas of every national forest in the United States, provides another section of the book. Growth of demonstration forests is outlined and typical examples are cited. Other sections deal with farm forestry, community forestry, forest co-operatives, forest industries and historic dates in the development of forest conservation. Growth of forestry laws is summarized and the text of the more important laws quoted verbatim. Information on wilderness areas, natural areas, and arborists, and a final section containing statistical and miscellaneous information winds up the whole subject.

ELEMENTS OF ENGINEERING REPORTS. By Dale S. Davis. Paper bound, iv plus 176 pages. Lithoprinted from the author's typescript by Edward Brothers, Inc., Ann Arbor, Michigan. Available, Bookstore, Virginia Polytechnic Institute, Blacksburg, Virginia. $1.65.

Representing the latest distillation from the literature and editorial experience on proper report writing technique, the book begins with the cover of a report and proceeds to its appendix, giving clear, complete, concise, and helpful information which is easy to understand and only a little harder to apply. Special attention is accorded illustrations and tables showing the best methods for presenting data and results in tabular and graphical form. One complete chapter is devoted to common faults and errors encountered in technical reports along with the recommended practices for their correction.

Another chapter, containing 18 illustrative figures, is devoted to graphical representation of engineering equations. The three main methods of presentation: a curve on ordinary coordinate paper, a straight line on specially ruled coordinate paper, and a nomograph are given along with the advantages and limitations of each method. Also included are comprehensive sections on spelling, nomenclature, precision of measurements, and editorial practice and illustrations drawn from the pulp and paper industry.

Humorous illustrations of often-met errors are extensively used throughout. The work should prove useful as a text for men preparing for industrial work and as a guide for those already engaged in providing the world with its essentials and luxuries.

Men who find themselves called upon to put their findings and ideas in concrete form should realize a large rate-of-return from this volume.

WOOD PULP STATISTICS. Compiled by D. A. Dennis. Published by United States Pulp Producers Association, 122 E. 42nd St., New York 17, N. Y. 1949. Paper cover, spiral bound. 199 pages 9 x 11½. $5.00, plus postage.

This is a three-section compilation of official data on wood pulp production, imports, exports, new supply and consumption, and records the trends of wood pulp supply and demand in the principal countries of the world.

A two page explanation of the terms used in the tables, charts and graphs precedes Section I. Section I covers United States production of wood pulp and paper, together with figures on new supply, consumption, imports and exports. Tables on prices, consumption, receipts and inventories of pulpwood are also provided.

Section II furnishes figures on production, new supply and consumption, imports, exports and capacity of foreign countries such as Argentina, Australia, Austria, Brazil, Canada, Chile, Cuba, Finland, France, Great Britain, Japan, Latin America, Mexico, Netherlands, Newfoundland, New Zealand, Norway and Sweden.

Section III contains world summaries on wood pulp, with figures on production, imports, exports and new supply, and capacity and production figures on world rayon.

HANDBOOK OF PATENTS. By Harry Aubrey Toulmin, Jr., J.D., Litt. D., LL.D. Published by D. Van Nostrand Co., Inc., 250 Fourth Ave., New York 3, N. Y. 1949. 920 pages. Cloth bound. 6½ x 9¼. $11.25.

Patent law presented in terms intelligible to the layman and applicable to his needs, whether he is an engineer, technician or businessman, is available in this comprehensive handbook. It is professionally accurate, yet simple enough for practical reference, and furnishes the underlying philosophy of patent law, giving a broad understanding of its relationship to manufacturing, research and engineering. Every chapter is a guide to the steps that must be taken, from investigating the novelty of an idea through preparing a patent application, prosecuting it to an issued patent, and protecting it by litigation in the courts. Preceding each major chapter is an introductory, orientation statement, which tells what the pages contain and how to use the information.

The international situation is discussed, with chapters on foreign patents, and the treaties and conventions dealing with patents to which the United States is a party. A chapter on special types of patents is valuable for its detailed treatment and illuminating examples of twelve distinct types of patents, with differences in details of treatment that result from their individual characteristics.

Special features of this book include an appendix of reference citations, specially-prepared series of questions and answers, and other aids needed to help the reader find information to deal with any situation involving patents safely and intelligently.

WALDEN'S PAPER PRODUCTION YEAR BOOK. Published by Walden, Sons & Mott, Inc., 41 Park Row, New York 7, N. Y. 1949. Cloth-bound. 274 pages. $3.00.

Composed of two sections, this directory has been compiled especially for the production man of the paper industry. The first section, dealing with supplies, lists suppliers, including key personnel, local representatives, and the products made or services rendered. Method of this presentation is then reversed by listing products and services alphabetically and under each the names of their suppliers. A complete directory of the paper industry, major mill machinery, products made, departmental heads, executives, and such details as telephone and teletype numbers comprise the second section. In the Pulp Section a list of mills, their representatives, agents, dealers, importers, and exporters, etc., has been compiled.

## Booklets and Pamphlets

TURNING TREES INTO PAPER. Published by Southern Newspaper Publishers Association, Chattanooga, Tenn. 1949. 12 pages. Many facts relating to the South's forest resources and their uses are contained in this bulletin special. Reports on problems in forest conservation and development, excerpts from a paper presented at the Kalamazoo Valley Section of TAPPI on natural resources, surveys, and news items concerning the pulp and paper industry comprise the bulletin.

DR. WILLIS H. CARRIER—FATHER OF AIR CONDITIONING. By Cloud Wampler. Published by Carrier Corp., 300 So. Geddes St., Syracuse 1, N. Y. 1949. 32 pages. This is an address delivered before The Newcomen Society of England at its annual dinner in Syracuse and deals with the life and work of Dr. Carrier in the air conditioning industry.

TECHNICAL BULLETIN No. 2. Published by Power Crane and Shovel Association, No. 74 Trinity Pl., New York 6, N. Y. 1949. 24 pages. 50c. This operating cost guide pamphlet is an aid to owners of power cranes and shovels in estimating the cost of ownership, operation and maintenance of this type of equipment.

AMERICAN MANAGEMENT SERIES. Published by American Management Association, 330 W. 42nd St., New York 18, N. Y. 1949. The Public Relations of Profits is a

paper presented at the Finance Conference of the Association. Price, 75c. The Practical Meaning of Management Statesmanship, What to Expect in Union Demands—The Outlook for Labor Legislation, What's Ahead in Employee Health and Pension Planning, and Identifying and Developing Potential Leaders are papers presented at Midwest Personnel Conference. Price, 75c each. Operating Under Decentralized Management—New Goals in Economic and Labor Policies. Price, 75c.

REPORT OF THE PREPARATORY CONFERENCE ON WORLD PULP PROBLEMS. Published by Canadian Pulp and Paper Association, Montreal, Canada, 1949. 58 pages. Contains brief statements from participating delegations outlining the main features of the wood pulp situation in their respective countries. Statistical summaries show regional and total effects of present estimates of projected consumption and production of wood pulp and pulpwood up to the year 1955. Several speeches are presented by participating delegates and reports of the Committee on Tropical Woods Utilization, and Straw Pulp and Strawboard are given.

CENSUS OF MANUFACTURES 1947. Published by U. S. Department of Commerce, Bureau of the Census, Washington 25, D. C. 19 pages. This is the first Census of Manufactures to be taken since 1939 and covers, for the 48 states and D.C., all establishments primarily engaged in manufacturing, as defined in the 1945 revision of the Standard Industrial Classification sponsored by the Bureau of the Budget.

HOW TO DO BUSINESS WITH THE QUARTERMASTER CORPS. Published by New York Quartermaster Purchasing Office, 111 E. 16th St., New York 3, N. Y. 1949. 16 pages. Designed basically as a guide to manufacturers and regular dealers interested in selling to the Quartermaster Corps, this pamphlet describes what is bought and how the prospective supplier can participate in the purchasing program.

## Manufacturers' Publications

*Through the co-operation of manufacturers and suppliers, THE PAPER INDUSTRY AND PAPER WORLD lists the following catalogues, bulletins, and booklets. They may be obtained without cost or obligation, unless otherwise specified, by writing direct to the manufacturers. Please address requests on your company letterhead.*

**Press.** Stacom Industries, Inc., 29-28 41st Ave., Long Island City 1, N. Y.—4-page brochure titled "A Preview of The Stacomizer" describes and illustrates a new basic machine for the process industries known as the Stacomizer. Mechanical principles and unique advantages of this roller type hydraulic press are given. Line drawings of the operating principles are also included.

**Alloy.** American Brake Shoe Co., 230 Park Ave., New York 17, N. Y.—6-page folder entitled "How to Reduce Abrasive Wear With Thermalloy HC-250" describes physical properties of Thermalloy HC-250. Uses and advantages are listed. Case histories are given and information is included on machining and high temperature service.

**Coating.** United Chromium, Inc., 51 East 42nd St., New York 17, N. Y.—4-page bulletin on Ucilon protective coatings contains information on four groups of coatings developed for corrosion control, chemical resistance and industrial painting. Facts on various formulations are outlined and cases cited where systems of these coatings ended difficult maintenance problems.

**Regulation System.** The Swartwout Co., 18511 Euclid Ave., Cleveland 12, Ohio—20 page Bulletin S-27 described new impulse feed water regulation systems and related equipment. Systems designed for higher pressure fast-steaming boilers are fully described and illustrated.

**Electrical Equipment.** Russeel & Stoll Co., Inc., 125 Barclay St., New York 7, N. Y.—12-page Bulletin No. EL49-263 contains illustrations, dimensional drawings and ordering information for automatic locking midget Ever-Lok plugs, receptacles and cord connectors.

**Belts.** Worthington Pump and Machinery Corp., Harrison, N. J.—8-page Bulletin No. V-1400-B18 describes and illustrates Vee Ply belting. Horsepower rating table, selection table and speed ratio selection charts are included.

**Controllers.** The Bristol Co., Waterbury, Conn.—32-page Bulletin No. A120 describes and illustrates Series 500 air-operated controllers for automatic controlling of temperature, pressure, flow, liquid level humidity and pH value. Data with pictures is given on on-off, proportional reset, derivative and reset plus derivative models.

**Resins.** Hercules Powder Co., Wilmington, Dela.—20-page booklet is a revised edition describing properties and uses of this company's synthetic resins. A key to specific uses for the resins is provided.

**Gas Absorbers.** The Patterson Foundry & Machine Co., East Liverpool, Ohio—6-page mimeographed booklet entitled "Agitated Gas Absorbers" is a discussion on processes for which gas absorption apparatus of the mechanical agitator type are best suited and included drawings of gas absorption systems. Reactions resulting in formation of solids, where solids are in suspension and various special industrial gas absorption are discussed.

**Speed Control.** Reeves Pulley Co., Columbus, Ind.—8-page Bulletin No. VN-4912 contains description, photographs, rating and dimension tables, and prices of the Vari-Speed Jr. unit for light horsepower requirements.

**Cylinders.** Ledeen Mfg. Co., 1600 So. San Pedro St., Los Angeles 15, Calif.—2-page leaflet No. CS 649 describes the use of hydraulic cylinders for controlling large gate valves. Actuating cylinders are illustrated and details given.

**Coatings.** A. C. Horn Co., Inc., 10th St. & 44th Ave., Long Island City, N. Y.—4-page bulletin describes and illustrates uses for plastic brush coating, an antiskid surface for floors. Other flooring products are listed.

**Diffusers.** Anemostat Corp. of America, 10 E. 39th St., New York, N. Y.—4-page Bulletin No. 28 explains operation and application of Type HU air diffusers for projection unit heaters. Contains photographs and lists dimensional data.

**Screw Grab.** Cleveland Crane & Engineering Co., 1006 E. 283rd St., Wickliffe, Ohio—Vol. 6, No. 1 of Cleveland Crane Graphic contains description and illustrations of the screw grab manufactued by this company. Cites a well-known paper company using this equipment.

**Precipitators.** Western Precipitation Corp., 1016 W. 9th St., Los Angeles 15, Calif.—8-page folder entitled "Facts of Interest to Every Paper Mill Operator" describes the Cottrell precipitator. Schematic diagram showing arrangement of precipitator installed with a recovery furnace and cascade evaporator is included.

**Welding.** Eutectic Welding Alloys Corp., 40 Worth St., New York 13, N. Y.—Bulletin entitled "Welding Notes for Engineers" contains stories of salvage by welding and solutions of difficult fabrication problems. Illustrated by photo reproductions.

**Pressure Recorder.** The Bristol Co., Waterbury, Conn.—Bulletin No. G620 describes Series 500 absolute pressure gauges and gives data on new principle of operation employed.

**Gas Equipment.** Bryant Industrial Division, 1020 London Road, Cleveland 10, Ohio—Catalogue No. 292 describes and illustrates thirty-three items of gas combustion equipment. Capacity and dimensional tables are included.

**Batteries.** Gould Storage Battery Corp., Trenton, N. J.—8-page Bulletin No. GB-1055 is a guide in selecting correct batteries for industrial trucks. Engineering specifications for almost 100 different size and capacity batteries are included.

**Instrument Panels.** Wheelco Instruments Co., 847 W. Harrison St., Chicago 7, Ill.—4-page Bulletin P1-1 contains prices and cut-out specifications of cabinet type instrument panels. Illustration of multiple installation is shown.

**Electrodes.** The Lincoln Electric Co., Cleveland 1, Ohio—20 page Bulletin 462 gives information and procedure pointers on shielded are welding. Guide for selection of electrodes, their applications, physical properties and procedures are included.

**Process Equipment.** The Bauer Bros. Co., 1759 Sheridan Ave., Springfield, Ohio—8-page Catalogue No. 50 illustrates and describes the complete line of process equipment manufactured by this company. A section is devoted to Fiber Products Laboratory and the Bauer Food and Milling Laboratory where research is conducted.

**Controllers.** Minneapolis-Honeywell Regulator Co., Wayne and Roberts Aves., Philadelphia 44, Pa.—32-page Bulletin No. 48-1 illustrates and describes both direct-connected and air actuated controllers. Details of special construction features and typical applications are given. Schematic drawings, diagrams and photographs, capacity charts, flow characteristics, pressure-temperature rating charts and dimensions are included.

**Chlorine.** Allied Chemical & Dye Corp., Solvay Sales Div., 40 Rector St., New York 6, N. Y. —60-page Bulletin No. 7 is second edition of Liquid Chlorine which contains latest information on properties of chlorine, chlorine containers, equipment and accessories, instructions for safe handling and procedure in case of leakage or accident. Illustrated with tables, charts and diagrams.

**Maintenance Chart.** United Laboratories, Inc., 16801 Euclid Ave., Cleveland 12, Ohio—3-way folder entitled "Maintenance Checking Chart" provides a complete list of products and services to plant and building maintenance superintendents.

**Valves.** Minneapolis-Honeywell Regulator Co., Wayne and Roberts Ave., Philadelphia 44, Pa. —Two descriptive bulletins contains information an the Schaefer By-Pass and Air-Operated Diaphragm Control Valves. Bulletin No. 254-1 describes the Schaefer By-Pass and includes schematic drawings and dimention charts. Bulletin No. 350-1 contains dimensions and data on Air-Operated Diaphragm Control valve and includes charts.

**Process Instruments.** Foxboro Co., Foxboro, Mass.—32-page Bulletin No. 427 shows complete line of Dynalog instruments for process measurements and control and auxiliary devices. Explanation of the all-electronic Dynalog principle of operation is given as well as details of construction of the instruments. Included are typical chart records in color of instruments shown, illustration of sensitive elements used with appropriate Dynalog instrument, dimensional drawings and photos of instrument panels, standard ranges available and direction for correct selection.

**Motors.** Louis Allis Co., Milwaukee 7, Wis —8-page Bulletin No. 722 describes the new line of single-phase motors manufactured by this company. Operation and models available are given. A table on typical performance of these units is shown, also typical single phase speed torque curve, connection diagrams, and interior and exterior pictures of control unit.

**Pumps.** Worthington Pump and Machinery Corp., Harrison, N. J.—3 bulletins have been issued by this company. 4-way folder type Bulletin H-450-B35 describes and illustrates oil lubricated vertical turbine pumps. Typical section of Type Q pump with parts identified is shown. Bowl design features are given, and pump sizes and capacities and standard specification are included. 4-way folder type Bulletin H-450-B34 describes and illustrates water lubricated vertical turbine pumps. Same information is given as for the oil lubricated vertical turbine pumps. 4-page Bulletin W-395-B1

describes and illustrates the all-steel self-priming centrifugal pumps. Specifications, pumping unit data and engine data are included.

**Recording Instruments.** The Dickson Co., 7420 Woodlawn Ave., Chicago, Ill.—10-page booklet furnishes information on recording instruments involving temperature, pressure, vacuum or electrical operation manufactured by this company. Descriptions and photographs of two units, Minicorder Temperature and Minicorder Pressure are given. Application charts and drawings of electric series operation and parallel operation are included.

**Valves.** Minneapolis-Honeywell Regulator Co., Brown Instruments Div., Wayne & Roberts Aves., Philadelphia 44, Pa.—20-page Bulletin No. 242-1 describes and illustrates the Hi-Lift V-Port indicating type hand control valves manufactured by this company. Many photographs and schematic drawings of the different designs and parts are included. Information on determining valve sizes, as well as capacity charts for liquids, air and gases, and steam is given.

**Testing Instruments.** E. J. Cady & Co., 134 N. LaSalle St., Chicago 2, Ill.—4-way folder describes and illustrates Bursting Strength Testers for boards, papers, fabrics and dial micrometers in various models for thickness measurement of sheet stock materials up to ½ in thickness. Also shown are basic weight scales for weight by 480, 500 or 1000 sheet count of papers and tissues and a boxboard scale which registers number of sheets per 50-lb bundle.

**Materials Handling.** Barrett-Cravens Co., 4609 So. Western Blvd., Chicago 9, Ill.—4-page Bulletin 4881 describes and illustrates, with prices, hand and barrel trucks, pick-up pallets, chisel trucks, reel trucks, carboy pourers, dollies, etc.

**Conveyor.** Rapids-Standard Co., Inc., Grand Rapids 2, Mich.—4-page folder describes and illustrates this company's portable power belt conveyor. Versatile features are explained, and engineering drawing of a model and specification table are included.

**Thermocouple Manual.** Wheelco Instruments Co., 847 W. Harrison St., Chicago 7, Ill.—40-page reprinted data book contains descriptions, prices and recommendations for thermocouples, heat-eyes, lead wire, thermocouple wire, heads, connectors, plug and socket assemblies, insulators, protecting tubes and essential information and curves for thermocouple selection and application.

**Optical Instruments.** Bausch & Lomb Optical Co., Rochester 2, N. Y.—16-page Catalogue D-104 contains an explanation of the phase contrast principle, an article on proven uses of this technique, plus actual photographs taken with this company's accessories. Specification tables for the Turret-type Abbe condenser and annular stop type L.W.D. condenser are given, also specifications for illuminators and microscope stands are shown. A price list for phase contrast accessories is included.

**Pump Maintenance.** Allis-Chalmers Mfg. Co., 991 S. 70th St., Milwaukee, Wis.—16-page Bulletin 08X6256A is a revised handbook on care of all makes of centrifugal pumps, and gives the how and why of pump construction and their effect on pump maintenance. Information on how to figure head, tables to determine total friction loss, causes and cures for various sources of trouble are offered along with a new maintenance timetable. Other subjects covered are some facts about cavitation and how to protect pumps against it; water as a pump lubricant and common mistakes in packing stuffing boxes. Cleverly illustrated.

**Trucks.** Clark Equipment Co., Battle Creek, Mich.—24-page booklet entitled "Material Handling News" is devoted to the Fairfax industrial district at Kansas City, Kans. and fork trucks. Illustrated with action photographs of handling operations.

**Control System.** Wheelco Instruments Co., 847 W. Harrison St., Chicago 7, Ill.—2-page Bulletin PC-1 describes the Panelmount Capacitrol series of indicating, pyrometer, controllers. Photographs and specifications are given.

**Equipment Failure.** The International Nickel Co., Inc., 67 Wall St., New York 5, N. Y.—6-page booklet entitled "How to Eliminate Unnecessary Shutdowns" presents technical information on materials used for equipment in plants such as washers, deckers, savealls, thickeners, filters, etc. Proper selection of materials is discussed. Contains illustrations.

**Heater.** Foster Wheeler Corp., 165 Broadway, New York 6, N. Y.—4-page brochure gives a complete description of a simplified verticle tubular heater. Cutaways drawing is shown.

**Materials Handling.** Towmotor Corp., 1226 E. 152nd St., Cleveland 10, Ohio—4-page booklet, Towmotor Job Study No. 84, details materials handling problem at a Clinton, Iowa plant before and after the arrival of the lift truck. Illustrated.

**Expansion Joints.** Chicago Metal Hose Corp., Maywood, Ill.—28-page bulletin titled "Design Guide to Expansion Joint Selection and Application" contains engineering data on corrugated type expansion joints. Included are numerous illustrations, charts, and tables. Information is given for each possible type of piping installation. Formulas for calculating required anchor strength are shown. A table giving data on the combined axial and lateral motion is claimed to be outstanding.

**Pressure Control.** The Emerson Manufacturing Co., Lawrence, Mass.—4-page Bulletin titled "Control Your Jordans" explains the new jordan plug pressure control and recording system. Reproductions of actual recordings of pressure are shown. Also, actual watt meter charts.

**Hose.** New York Belting & Packing Co., 1 Market St., Passaic, N. J.—12-page catalogue describes and illustrates water hose and water suction hose. Photographs of applications and specification tables are included.

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*of your river*

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WATER CONDITIONING HEADQUARTERS FOR OVER 35 YEARS

# MARKET QUOTATIONS

## RAGS (Domestic)

### NEW RAGS

Quotations to consuming mills, cents per pound or dollars per hundred pounds, f.o.b. New York, follow:

| | per cwt. |
|---|---|
| Blue Overalls | 6.25 to 6.50 |
| Corduroy, Men's | 5.25 to 5.50 |
| Corduroy, Ladies' | 5.25 to 5.50 |
| Washables, No. 1 | 3.50 to 3.75 |
| Percales | 6.00 to 6.25 |
| Light Prints, No. 1 | 5.50 to 5.75 |
| Khaki Cuttings— | |
| Bleachable | 4.50 to 4.75 |
| Unbleachable | 4.00 to 4.25 |
| New White Canvas | 11.50 to 12.00 |
| New Mixed Blacks | 4.00 to 4.25 |
| Canton Flannels, Bleached | 10.75 to 11.00 |
| Shirt Cuttings— | |
| New White No. 1 | 10.50 to 11.00 |
| White Shrunk | 10.00 to 10.25 |
| Silesias No. 1 | 7.00 to 7.25 |
| New Unbleached | 10.50 to 11.00 |
| Fancy | 5.25 to 5.50 |
| Linen Cuttings— | |
| American | 8.00 to 8.50 |
| White | 14.00 to 15.00 |
| Grey | 13.50 to 14.00 |

## RAGS (Domestic)

### OLD RAGS

Quotations to consuming mills, dollars per hundred pounds, f.o.b. New York, follow:

| | per cwt. |
|---|---|
| Roofing— | |
| No. 1 | 1.25 to 1.30 |
| No. 2 | 1.15 to 1.20 |
| No. 3 and No. 4 | .95 to 1.05 |
| Twos and Blues— | |
| Repacked | 3.00 to 3.25 |
| Thirds and Blues— | |
| Repacked | 2.75 to 3.00 |
| Miscellaneous | 2.25 to 2.50 |
| Whites, No. 1— | |
| Repacked | 4.75 to 5.00 |
| Miscellaneous | 3.50 to 3.75 |
| White, No. 2— | |
| Repacked | 3.50 to 3.75 |
| Miscellaneous | 2.75 to 3.00 |

## RAGS (Foreign)

ex dock New York City

### NEW RAGS

| | per cwt. |
|---|---|
| New Dark Cuttings | Nominal |
| New Mixed Cuttings | |
| New Light Silesias | |
| Light Flannelettes | |
| Unbleached Cuttings | |
| New White Cuttings | |
| New Light Oxfords | |
| New Light Prints | |

## RAGS (Foreign)

ex dock New York City

### OLD RAGS

| | per cwt. |
|---|---|
| No. 1 White Linens | Nominal |
| No. 2 White Linens | |
| No. 3 White Linens | |
| No. 4 White Linens | |
| No. 1 White Cottons | |
| No. 2 White Cottons | |
| No. 3 White Cottons | |
| No. 4 White Cottons | |
| Extra Light Prints | |
| Dark Light Prints | |
| Med. Light Prints | |
| Dutch Blue Cottons | |
| French Blue Cottons | |
| French Blue Linens | |
| Checks and Blues | |
| Linsey Garments | |
| Dark Cottons | |
| Old Shopperies | |

## ROPE and BAGGING

f.o.b. and ex dock New York City

| | per cwt. |
|---|---|
| Gunny No. 1— | |
| Foreign | Nominal |
| Domestic | 8.00 to 8.50 |
| Wool Tares— | |
| Light | 8.00 to 8.50 |
| Heavy | 8.50 to 9.00 |
| No. 1 Scrap Bagging | 5.75 to 6.00 |
| Manila Rope— | |
| No. 1 large | 5.50 to 5.75 |
| No. 1 small | 4.50 to 4.75 |
| Sisal Rope— | |
| No. 1 large | 5.00 to 5.25 |
| No. 1 small | 4.50 to 4.75 |
| New Burlap Cuttings | 7.50 to 8.00 |
| Jute Threads— | |
| Foreign (Nom.) | 6.50 to 7.00 |
| Domestic | 6.00 to 6.50 |
| Strings— | |
| No. 1 sisal | 4.50 to 4.75 |
| No. 2 sisal | 4.00 to 4.25 |
| Soft jute | 4.25 to 4.50 |
| Mixed | 2.50 to 2.75 |

## WASTE PAPER

The following are quotations, dollars per ton, for No. 1 packing f.o.b. New York:

| Shavings— | per ton |
|---|---|
| Hard White Env. Cuts. | 95.00 to 100.00 |
| Hard White, No. 1 | 75.00 to 80.00 |
| Soft White No. 1 | 70.00 to 75.00 |
| Soft White, one-cut | 85.00 to 90.00 |
| Soft White, Misc. | 55.00 to 60.00 |
| Fly Leaf, No. 1 | 30.00 to 32.50 |
| Fly Leaf, Woody No. 1 | 22.50 to 25.00 |
| No. 2 Mixed Col. Woody | 17.50 to 20.00 |
| Flat Stock— | |
| No. 1 Heavy Books and Magazines, Repacked | 26.00 to 28.00 |
| Mixed Books | 13.00 to 14.00 |
| Ledger Stock— | |
| No. 1 White | 40.00 to 45.00 |
| No. 1 Mixed (Colored) | 30.00 to 35.00 |
| Manilas— | |
| New Env. Cuttings | 60.00 to 65.00 |
| New Env. Cuts, One-Cut | — |
| Extra Manilas | — |
| Manila Tab Cards, Free of Ground Wood | 65.00 to 70.00 |
| Colored Manila Tab Cards | 35.00 to 40.00 |
| Kraft— | |
| New Envelope Cuttings | 60.00 to 65.00 |
| Tripled Sorted No. 1 100% | 30.00 to 35.00 |
| New 100% Cor. Cuts | 30.00 to 35.00 |
| No. 1 Old Assorted | 25.00 to 27.50 |
| News— | |
| White Blank | 45.00 to 50.00 |
| Overissue | 14.00 to 15.00 |
| No. 1 Folded | 10.00 to 11.00 |
| Old Corrugated Containers | 16.00 to 18.00 |
| New Jute Corrugated Cuts | 20.00 to 22.00 |
| Mill Wrappers | 8.00 to 9.00 |
| Box Board Chips | 7.00 to 8.00 |
| No. 1 Mixed Paper | 7.00 to 8.00 |

## CHEMICALS

f.o.b. shipping point

| | |
|---|---|
| Alum (Papermakers)— | |
| Lump, cwt. | 4.05— |
| Ground, cwt. | 3.80— |
| Powdered, cwt. | 4.20— |
| Blanc Fixe— | |
| Pulp, bulk, ton | 77.50— |
| Dry, barrels | 85.00— |
| Bleaching Powder— | |
| Drums, cwt. | 4.25 to 4.50 |
| Casein (Domestic Standard) | |
| 20-30 mesh (bags), lb. | |
| 80-100 mesh (bags), lb. | 21.00 to 22.00 |
| Argentine, lb. | 19.50 to 20.00 |
| China Clay— | |
| Domestic Filler | |
| Bulk (mine) ton | 10.00 to 15.00 |
| Domestic Coating | |
| Bulk (mine) ton | 15.00 to 25.00 |
| Imported (ship side) | |
| Bulk (lump) ton | 22.00 to 30.00 |
| Chlorine— | |
| Tank cars (wks) cwt. | 2.40 to 2.70 |
| Gelatine (silicin), lb. | 1.25 to 1.35 |
| Glyc. (C.P.) drums, lb. | .24½ to .25 |
| Litharge, powd. bbl. lb. | .16½ to .17½ |
| Rosin (Gum)— | |
| New York, per 100 lbs. | |
| E | 7.65— |
| F | 7.65— |
| G | 7.65— |
| WWX | 7.80— |
| Rosin (Wood), carlots, F.O.B. South | 4.25 to 4.50 |

# MARKET QUOTATIONS

| | |
|---|---|
| **Salt Cake—** | |
| Dom. bulk (wks) ton | 22.00 to 24.00 |
| Imp. bulks on dock— (Atl. ports) ton (Nom.) | 25.00— |
| **Soda Ash—** | |
| Bulk (works), cwt. | 1.10 to 1.20 |
| Paper Bags, cwt. | 1.30 to 1.40 |
| Barrels, cwt. | 1.70 to 1.80 |
| **Soda (Caustic)—** | |
| Solid drums, cwt. | 3.05 to 3.10 |
| Ground and flake, drums, cwt. | 3.45 to 3.50 |
| **Sodium Silicate—** | |
| 60 deg. 55 gal. drums, (works) cwt. | 1.65 to 2.05 |
| 40 deg. 35 gal. drums, (works), cwt. | .80 to 1.45 |
| **Starch—** | |
| Pearl, 140 lb. bags, cwt. | 4.82— |
| Pearl, barrels, cwt. | 4.82— |
| Paper, (Sp.) bags, cwt. | 4.82— |
| Powdered, barrels, cwt. | 4.93— |
| **Sulphur (Crude)** | |
| (Mine) bulk, long ton | 16.00 to 18.00 |
| **Talc—** | |
| Dom. 100 lb. bags (mine) ton | 22.00 to 28.00 |
| Canadian | 35.00 to 45.00 |
| **Titanium Dioxide—** | |
| Barium Pig. bbls., lb. | .19¼ to .21 |
| Calcium Pig. bbls., lb. | .19½ to .21 |
| Zinc Sulphide, bbls., lb. | 11.50 to 11.75 |

## WOOD PULP

Prices, dollars per short, air dry, ton, on dock American ports and f.o.b. shipping points with former OPA freight allowances, are:

| | |
|---|---|
| Bleached sulphite, Swed. | 118.00 to 122.00 |
| Bleached sulphite, Finish. | 118.00— |
| Bleached sulphite, dom. | 118.00— |
| Easy bleaching sulphite | — |
| Unbleached kraft, Finn | 94.00— |
| Unbleached sulphite, Swed. | 100.00 to 105.00 |
| Unbleached sulphite, Fin. | 115.00— |
| Unbleached sulphite, dom. | 100.00— |
| Unbleached kraft, Swedish | 85.00 to 90.00 |
| Unbleached kraft, northern | 94.00 to 105.00 |
| Unbleached kraft, southern | 80.00— |
| Bleached sulphate, Swedish | 125.00 to 128.00 |
| Bleached soda, domestic | 113.00— |
| Sulphite screenings, dom. | 40.00 to 50.00 |
| Sulphate screenings, dom. | 40.00 to 50.00 |
| Groundwood, domestic and Canadian | 60.00 to 65.00 |

## PAPER

f.o.b. New York City

| | |
|---|---|
| **Boards—** | per ton |
| Binders | 94.00— |
| Chips | 70.00— |
| Chip, tube and can | 75.00— |
| Chip, full blending | 77.50— |
| Chip, agl. mla. lined | 77.50— |
| Coated, white patent .016 | 110.00— |
| .020 and heavier | 100.00— |
| Kraft liner | 95.00 to 105.00 |
| Filled News | 70.00— |
| Container | 85.00— |

Book Papers—f.o.b. mill with quantity, weight, manufacturing and other differentials allowed:

(Per cwt. in ton lots)
Uncoated (Untrimmed)

| | |
|---|---|
| Book, White (M. F.)— | |
| A Grade E. F. | 13.40— |
| B Grade E.F. | 14.90— |
| A Grade S. C. | 15.90— |
| B Grade S. C. | 15.40— |
| No. 2 Uncoated Offset 4 sides, White | — |
| Machine Coated White (Trimmed 4 sides) | |
| No. 1 Glossy | 20.75— |
| No. 2 Glossy | 19.50— |
| No. 3 Glossy | 18.15— |
| No. 4 Glossy | — |
| No. 2 Offset | 14.60— |
| C1S Litho (Varnish) | — |
| C1S Litho (Non-Varnish) | — |

Writing Papers—f.o.b. mill with zone, quantity, packing and other differentials allowed:

| | |
|---|---|
| **Rag Content Bond—** (In Ton Lots) | per cwt. |
| Extra 100% Rag | 51.40— |
| 100% Rag | 44.55— |
| 75% Rag | 32.90— |
| 50% Rag | 23.10— |
| 25% Rag | 24.35— |
| **Rag Content Ledger—** (In Ton Lots) | per cwt. |
| Extra 100% Rag | 52.65— |
| 100% Rag | 45.65— |
| 75% Rag | 35.15— |
| 50% Rag | 29.40— |
| 25% Rag | 26.15— |
| **Sulphite Bond—** | per cwt. |
| Air dry, watermarked | — |
| No. 1 watermarked | 17.50— |
| No. 2 watermarked | 16.60— |
| No. 4 watermarked | 15.60— |
| **Sulphite Ledger—** | per cwt. Zone |
| No. 1 watermarked | 18.80— |
| No. 2 watermarked | 18.05— |
| No. 4 watermarked | 17.50— |
| **Glassine (f.o.b. mill)—** | per cwt. |
| Embossed (25 lb. up) | — |
| Bleached (25 lb. up) | — |
| Unbleached (25 lb. up) | — |
| Greaseproof— Bleached (25 lb. up) | — |
| Unbleached (25 lb. up) | — |
| **News—** | per ton |
| Rolls, Standard Contract) | 100.00 to 103.00 |
| Rolls (Spot) | (Nominal) |
| Sheets | 119.00— |
| **Tissues (Carlots)—** | per ream |
| White No. 1 | 1.55— |
| White No. 2 | 1.20— |
| Bleached Anti-Tarnish | — |
| Colored | — |
| Anti-Tarnish Kraft | 1.37½— |
| Manila | 1.60— |
| Napkins, semi-crepe (12½ lb. to M shts.) per cs. | .80— |
| Napkins, full crepe and emb'sed (12½ lb. to M shts.) per cs. | .80— |
| Toilet, Bleached (M. shts.) per cs. | 6.80 to 6.95 |
| Toilet, Unbleached (M. shts.) per cs. | 5.75— |
| **Towels—** | per case |
| Bleached | 5.25— |
| Unbleached | 4.50— |
| **Wrappings (Kraft)—** | per cwt. |
| Super-Standard | 8.00 to 8.50 |
| No. 1 Wrapping | 7.00 to 7.50 |
| Standard Wrapping | 6.25 to 6.75 |
| Standard Bag | 5.75 to 6.25 |
| Variety Bag | — |
| **Wrappings (Sulphite and Bleached Kraft)— (Rolls, f.o.b. mill)** | |
| **Bleached Papers—** | per cwt. |
| M.F. & M.G. Waxing, 20 lb. (Carloads only) | — |
| (10,000 lb.) | — |
| Drug wrapp., 35 lb. | — |
| **Unbleached Papers—** | |
| Com. Gr. Butch. 40 lb. | — |
| No. 1 Butchers | — |
| No. 1 Imit. Parch. & Dry Fin. Groc. Sulphite, 30 lb. | — |
| No. 2 Imit. Parch. & Dry Fin. Groc. Sulphite, 30 lb. | — |
| Steam Finish, 50 lb. | — |
| Water Finish, 50 lb. | — |
| **Manilas—** | |
| Envp. Mla., Sub. 16-40 (No. 1) | — |
| Envp. Mla., Sub. 16-28 (No. 2) | — |
| Envp. Mla. (Prices based on large sheets untrim'd ream marked, in bdls.) | — |
| **Wrapp Mla. 35 lb. up—** | |
| No. 1 | — |
| No. 2 | — |
| **M.G. Sulphite and Kraft (other than Waxing)** | |
| Grade B20 lb. | — |
| Grade A-22 lb. | — |

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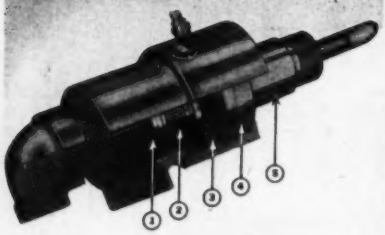

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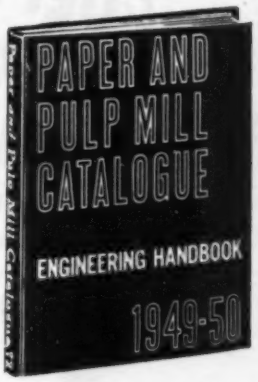


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